FM Radio Capability in Smartphones on the Increase

FM radio offers an excellent alternative to smartphone audio streamers who want to cut back on their data usage. With the release of the NextRadio app preloaded in many Sprint smartphones, the trend of FM radio availability in smartphones has made a giant leap from just two years ago. The availability of FM radio chips in smartphones is not a new phenomenon, however. Data obtained by NAB Labs from Strategy Analytics and ABI Research shows that for at least the past two years, FM radio chips have been present in nearly all of the top-selling smartphones. Yet despite their presence in millions of devices, many U.S. wireless carriers or phone manufacturers have blocked this feature from smartphone users. All of the smartphones NAB Labs is currently tracking (i.e., the top-selling 70%, representing the top 20 to 25 models sold in in a typical calendar quarter) now have an FM tuner chip installed, but the level to which it is integrated into both the hardware and software of the phones varies considerably.

FM radio receivers found in smartphones are typically bundled with Bluetooth and WiFi on a "connectivity" chip. On most smartphones, the FM capability of this chip is not enabled, and neither the FM antenna input nor the FM receiver's demodulated output is connected to anything. On other smartphones, however, the FM receiver capability of the connectivity chip is enabled, with the receiver's RF input connected to the phone's headphone jack (for the use of the headphone cable as an external VHF antenna), and the FM receiver's demodulated output connected to the phone's multimedia processing (feeding it analog stereo audio and in some cases, RDS text data). The phone's operating system is also connected to the FM receiver for control and display of tuning and possibly other features, via a user-interface app on the phone. (This app—or the phone's settings—may include an option to override the phone's switching off of its speaker[s] when the headphones are plugged in, to allow the use of the headphones for an antenna but not for listening.) The FM app may be native to the phone, or in some cases a third-party app can connect to the FM receiver via an API—which is how NextRadio is enabled on those phones. Thus there are three basic technical categories of FM enablement in smartphones:

1. FM receiver hardware is on board, but not enabled
2. FM receiver is enabled and connected, accessible to a native app in the phone OS
3. FM receiver is enabled and connected, accessible to a native app and to third-party apps via API

NAB Labs analysis shows that there is another complication, however, which is wholly non-technical in nature. It involves a clear choice by the wireless carrier as to whether to expose the FM receiver capability on phones of category 2 and 3 above to its users. This is evidenced by certain smartphone
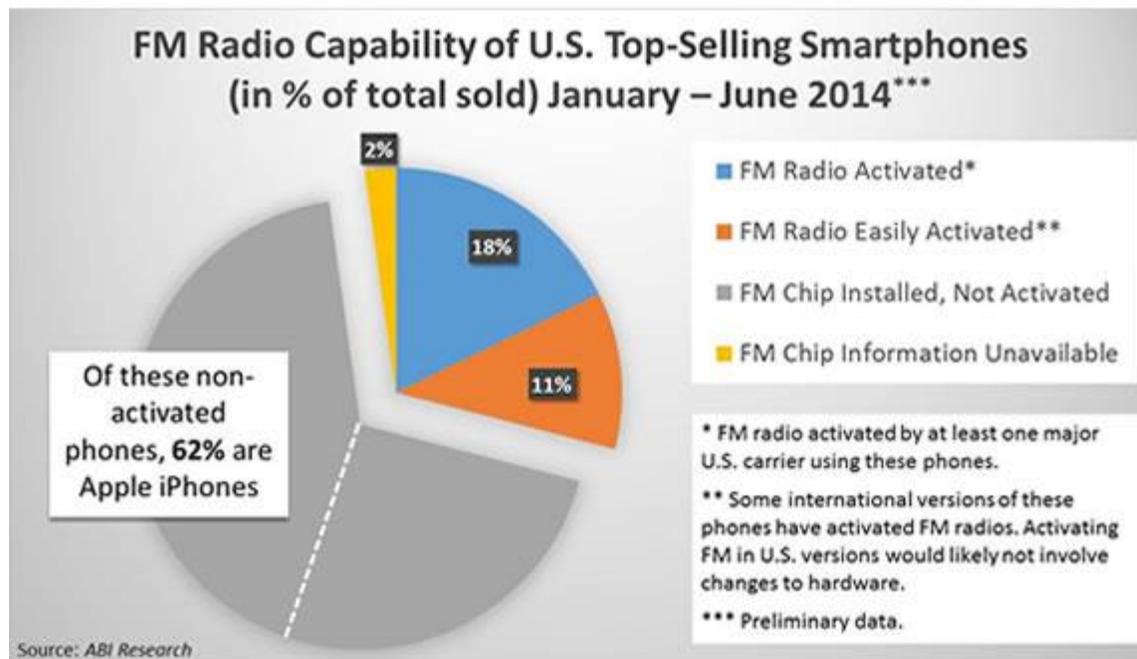
models having their FM receiver capability available to users in some *countries* but not others (with the U.S. often being among the latter), or more recently, by certain phones having FM capability *within the U.S.* when sold *by some carriers but not others*, as detailed below.

Note that smartphones in category 3 above enable hybrid radio capability, by which an app can combine content received off-air via the FM receiver with text and graphical enhancements obtained by the smartphone's broadband connection to a website feeding resources corresponding to the currently tuned FM station. The app can also allow convenient browsing to other websites via hyperlinks inserted in the enhancement content, in some cases accompanied by geolocation data provided by the smartphone. But of course, to enable these powerful features, the smartphone must first include a working FM receiver.

Good News, Bad News

The bad news: By NAB Labs' tabulation (see graphics below), in the first half of 2014, the phones described by category 1 above still accounted for 69% of the top-selling smartphones in the U.S., but— the good news—that number is down from 74% in the calendar year 2013. Thus the trend is positive for FM being increasingly enabled in smartphones. Note that Apple iPhones currently account for 62% of the phones sold in this category.

Allowing for the 2% of top-selling smartphones for which NAB Labs was unable to obtain data, the remaining 29% of leading smartphones sold in the U.S. between January and June 2014 either had FM enabled by at least one U.S. carrier (18% of total sold), or the same phone models were FM-enabled in other countries (11% of total sold). For these phones, it is relatively easy for all U.S. versions to be fully FM-enabled—or put another way, the reason any of these phones are not FM-enabled is purely a carrier choice. Again, this "technically FM-enabled" 29% of the top-selling smartphones in the U.S. was up for the first half of 2014 from 25% in 2013.

FM Radio Capability of U.S. Top-Selling Smartphones (in % of total sold) January – June 2014***

- FM Radio Activated*
- FM Radio Easily Activated**
- FM Chip Installed, Not Activated
- FM Chip Information Unavailable

Of these non-activated phones, **62%** are Apple iPhones

* FM radio activated by at least one major U.S. carrier using these phones.

** Some international versions of these phones have activated FM radios. Activating FM in U.S. versions would likely not involve changes to hardware.

*** Preliminary data.

Source: ABI Research

Confusion Reigns

A good example of both international and domestic variations on enabling FM is provided by the popular Samsung *Galaxy* smartphone series. The *Galaxy S3*, one of the most popular phones of 2012, was fully FM enabled outside the U.S., but the same phone sold by multiple carriers in the U.S. had no FM capability exposed. On the other hand, on the equally popular successor *Galaxy S4*, Samsung removed FM radio capability, and thus no carrier anywhere could offer it, although FM receiver hardware still existed on the phone's connectivity chip. Yet in the next-generation product, the *Galaxy S5*, Samsung reversed course and reinstated FM capability. This version of the phone has FM radio activated both internationally and in Sprint's domestic version (which includes the NextRadio app preloaded). FM capability is not available to U.S. users who obtain the S5 from AT&T, Verizon or T-Mobile.

This trend of *domestic* differences in FM capability among major U.S. wireless carriers has continued, with another interesting example in the *HTC One M8*. Again it comes fully FM-enabled with NextRadio included from Sprint, and is equipped with a native FM app from AT&T, but FM is not exposed on Verizon versions. (Verizon's marketing and user manual for the M8 make no mention of the phone's FM capability.) Interestingly, however, AT&T and Verizon users can download the NextRadio app to the HTC One M8 from an Android app store, and then have the same functionality as is provided on Sprint versions.

Upward Mobility

Meanwhile, the argument remains that FM radio provides a robust method of receiving potentially life-saving information during crisis periods when wireless broadband service may be temporarily disabled or overloaded, and this point is gaining traction within regulatory circles. Of course, FM listening on smartphones has the additional consumer-friendly advantages of not consuming any of a user's monthly data-plan quota, and extending battery life. (A recent study conducted by Sprint and NextRadio indicates that FM listening may extend battery life up to six times when compared with audio streaming services.)

While it is clear that the FM-radio-in-smartphones environment remains complex and confusing to U.S. consumers, the strong growth in FM-capable smartphone sales provides evidence that demand for the feature is strong, and the Sprint/NextRadio alliance is having broad and significant effect.

NAB Labs will continue to monitor these trends and provide regular updates on its web page devoted to the subject and elsewhere. (A paper on this subject will be presented at the 2015 NAB Broadcast Engineering Conference in Las Vegas.)

Smartphones Sold in U.S. with FM Radio Activated (millions)*

* FM radio activated by at least one major U.S. carrier using these phones.

	Q3 2012	Q4 2012	Q1 2013	Q2 2013	Q3 2013	Q4 2013	Q1 2014	Q2 2014
Millions	1.3	0.3	0.6	0.7	0.8	2.3	2.1	8.2

Sources: *Strategy Analytics and ABI Research*

NAB Engineering Achievement Award Nominations

NAB is currently accepting nominations for the 2015 NAB Engineering Achievement Awards. Established in 1959, the NAB Engineering Achievement Award is presented each year to an individual for outstanding accomplishments in the broadcast industry. In 1991, NAB began giving awards separately for achievements in radio and television. The award winners will be recognized at the Technology Luncheon at the 2015 NAB Show on April 15 in Las Vegas, Nev.

The candidates for the two awards will be evaluated on the basis of a single contribution, or multiple contributions that have significantly advanced the state of the art of broadcast engineering. The size of the candidate's organization is not a determining factor. Instead, only the merits of the individual's contributions are taken into account.

Candidates must be or have been an owner, officer or employee of a company, subsidiary or division whose primary business is, or directly supports broadcasting. This includes employees of the Federal government directly engaged in broadcast engineering work.

The candidates shall have made contributions in the following categories:

- Inventions
- Development of new techniques
- Dissemination of technical knowledge and literature
- Leadership in broadcast engineering affairs
- An outstanding contribution which, in the opinion of the NAB Executive Committee, warrants consideration.
- The candidates engineering contributions should span a reasonable period of time. The NAB Executive Committee will select the award winners, and will emphasize the more recent achievements of the nominees.

The nomination form is available on NAB's Engineering Achievement Award website, and the deadline is **January 16, 2015.**

	Engineering Achievement Award Winners 2000 - 2014
2014	Jeff Littlejohn, Clear Channel (R) Robert Seidel, CBS (T)
2013	Frank Foti, Telos Alliance (R) Jay Adrick, Harris Broadcast (T)
2012	Paul Brenner, Emmis Communications (R) Glenn Reitmeier, NBC Universal (T)
2011	Robert du Treil, du Treil, Lundin & Rackley (R) Thomas B. Keller, Consultant (and Formerly NAB) (T)
2010	Steve Church, Telos Systems (R) Mark Richer, Advanced Television Systems Committee (T)
2009	Jack Sellmeyer, Sellmeyer Engineering (R) Sterling Davis, Cox Broadcasting (T)
2008	Thomas B. Silliman, Electronics Research, Inc.(R) Antoon Uyttendaele, ABC Inc (T)
2007	Louis A. King, Kintronic Laboratories, Inc. (R) Victor Tawil, Association for Maximum Service Television (T)
2006	Benjamin Dawson, Hatfield and Dawson (R) Ronald Rackley, du Treil, Lundin and Rackley, Inc. (R) S. Merrill Weiss, Merrill Weiss Group LLC, (T)
2005	Milford Smith, Greater Media, Inc. (R) Oded Bendov, TV Transmission Antenna Group, Inc. (T)
2004	E. Glynn Walden, Infinity Broadcasting (R) Ira Goldstone, Tribune Broadcasting (T)
2003	John Reiser, FCC (R) Bob Eckert, FCC (T)
2002	Paul Schafer, Schafer International (R) Bernard Lechner, Consultant (T)
2001	Arno Meyer, Belar Electronics Laboratory, (R) Larry Thorpe, Sony Electronics, Inc. (T)

NAB Webcast: Cybersecurity for Broadcasters

Target, AT&T and the U.S. Nuclear Regulatory Commission are only a few of the major enterprises to suffer high-profile cyber-attacks in recent months. In fact, a host of radio stations in Arkansas, Virginia and elsewhere have recently suffered "ransomware" attacks that locked up their data servers and music files. Don't be next. As the primary outlet for Americans' access to news, emergency updates and live entertainment and sports, it is critical that broadcasters diligently protect their operations from digital intrusions.

Radio and television stations must increase their awareness of hacking, spoofing and other cyber breaches that could disrupt programming and advertising, undermine the Emergency Alert System (EAS), or even compromise your employees' privacy.

This webcast will provide up-to-date guidance on government and industry initiatives concerning cybersecurity and discuss recommendations for reducing your operation's cyber risks.

Presenters:
Clete Johnson, chief counsel for Cybersecurity, Public Safety and Homeland Security Bureau, Federal Communications Commission
Christopher Homer, vice president, Operations and Engineering, Public Broadcasting Service
Kelly Williams, senior director, Engineering and Technology Policy, National Association of Broadcasters
Larry Walke, associate general counsel, National Association of Broadcasters

Live webcast: Wednesday, December 10, 2014, 2 – 3 p.m. EST
Webcast participants will have the opportunity to email questions during the live presentation. An archive of each webcast will be available within 24 hours following the webcast and can be accessed for a full year. Click here to register.

Questions? Please contact NAB's Legal department at (866) 682-0276.

Deadline Approaching for NAB Labs Futures Park Exhibitors

Do you know someone who might be interested in exhibiting their media-related technology R&D projects at the 2015 NAB Show? Applications to participate in the 2015 NAB Labs Futures Park at the Las Vegas Convention Center, Las Vegas, Nev., April 13-16, 2015 must be submitted by **December 5, 2014**.

NAB Labs Futures Park is a reserved area of the NAB exhibit floor that exclusively features media-related technology R&D efforts in progress around the world. For a quick look at last year's Futures

Park, visit the [Futures Park page](). The Park is a popular venue for both exhibitors and attendees, and receives considerable press attention every year.

NAB supplies complimentary exhibit space to all organizations accepted for participation in Futures Park. Applications or questions should be directed to Katy Armstrong at [karmstrong@nab.org]().

Important Dates and Upcoming Events

2015 NAB Show

April 11 - 16, 2015

Las Vegas, NV

NAB Webcast: Cybersecurity for Broadcasters

Wednesday, December 10, 2014

2 – 3 p.m. EST