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XM Satellite Radio: Revolutionizing the Airwaves

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Abstract. Based primarily on public information, the XM case was written for an MBA Marketing Strategy course focused on technology adoption. It has also been used with undergraduates and executives, both in "survey" courses and specialized courses on pricing, market forecasting, and promotion. The case broadly covers XM's marketing challenge: how to capitalize on a $1.5 billion investment to achieve a stated goal of "revolutionizing the airwaves" and becoming "a premier nationwide provider of audio entertainment and information programming". Market forecasts indicated a potential of almost 50 million subscribers. During its first year, XM spent over $100 on promotion but signed up less than 500,000 subscribers—far below the 4 to 7 million subscribers required to break even. The company was bleeding red ink with a high "burn rate" that had depleted cash reserves. The company had scrounged supplemental financing, but still faced a crisis of market and financial viability.

Keywords: marketing strategy, technology adoption, satellite radio, new products, radio broadcasting, digital music.

> We intend to change radio the way cable and DBS changed television, by providing compelling entertainment choices to consumers.
>
> *XM CEO Hugh Panero*

Radio from the Stratosphere: Will America buy satellite radio? We're about to find out.

Before cable TV, skeptics said people wouldn't pay for something they can get for free. It was the same reaction when Perrier bottled water came to America. Now that question arises again with the arrival of XM Satellite Radio.

It isn't cheap. To hear it you need a special radio costing $250 to $850, and then you pay $10 a month. The attraction is high-quality sound, better than

1. This case was developed by Professor Ken Homa based primarily on public information, and draws heavily on XM's SEC disclosure documentation. It is intended for class discussion only.

> FM radio, and with 71 music channels plus 29 news, talk, sports, and entertainment channels, all of which you can listen to across the country. Cadillac Seville and DeVille models will offer optional factory-installed XM radios this fall with at least 20 more GM models following next year. Some of those radios include digital displays that tell you the name of the song and performer you're hearing.
>
> XM radio is especially attractive in remote areas where there isn't much radio, and truckers may love it because they can listen to their favorite channels as they drive cross-country. But those markets alone aren't enough to pay back the billion-dollar investment in XM. For that it will need fans in the cities. We'll soon find out if it can get them.[2]

1. Introduction

In October 1997, XM Radio paid $89 million for one of two licenses allocated by the FCC to develop and operate a satellite radio service within the United States. Immediately, XM began chasing a corporate dream of becoming "a premier nationwide provider of audio entertainment and information programming for reception by vehicle, home and portable radios".[3]

XM actually raised over $1.5 billion—mostly from strategic investors including General Motors, Clear Channel Communications, and Hughes Electronics (DIRECTV). The capital was quickly deployed on an infrastructure of satellites and terrestrial repeater stations, the development of broadcasting and receiver technologies, the building of a showcase headquarters facility with over 80 digital production studios, and establishment of a nationwide distribution network. In November 2001, XM officially launched the first nationwide satellite radio service and immediately earned wide acclaim. According to *Fortune* Magazine:

> XM Satellite Radio is the Product of the Year. Of all the new technologies launched in 2001, XM Satellite Radio is way, way, way above the rest. It's the first major advance in radio since FM emerged in the 1960s, and the best thing to happen to mobile music since the dashboard CD player. XM delivers a diverse selection of 100 digital channels—jazz, rock, news, bluegrass, sports, hip-hop, etc.—in nearly CD-quality sound, whether you're sitting in a Cadillac in the big city or in a pickup truck in the boonies. Think of it as premium radio. You won't have to listen to commercials on many of the stations. If you spend a lot of time on the highways, you'll never go back to listening to stations that fade in and out and don't play your kind of music.[4]

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2. Geoffrey Colvin, *Fortune*, October 17, 2001.
3. XM Radio 10-K 2000.
4. Peter Lewis, *Fortune*, December 24, 2001.

According to XM, its initial subscribers agree: the vast majority rate the overall service and sound quality as "excellent", and nearly all consider satellite radio to be a "good" or "excellent" value.[5]

Rolling into 2002, XM's satellite infrastructure was essentially complete and service was operational. But, the company still faced the prospects of significant operating losses for several years, until it reached a critical mass of subscribers. Stating the obvious, XM's management reported that: "Our ability to become profitable ultimately depends upon our substantially increasing the number of our subscribers."[6] More specifically, most industry experts believe that XM will need a minimum of 4 million subscribers to reach financial breakeven given its extraordinarily high fixed cost structure; some analysts peg the breakeven point to be as high as 7 million subscribers.

2. The Radio Business

Radio is a ubiquitous media in the U.S. According to the Radio Advertising Bureau, radio reaches 84% of all consumers during a typical week; 78% of consumers listen to the radio every day; and, an average person listens to the radio over 20 hours per week. In-vehicle listening is extensive: 43% of radio listening is done in cars (versus 37% at home and 21% at work and other places), mostly during "drive-time" (commuting to and from work[7]), at midday (going to and from lunch), sporadically while running errands (soccer moms & dads), as part of a daily job ("road warriors"), and around-the clock (e.g. over 1 million long-haul truck drivers). Radio is the "out of home" media.

Radio broadcasting has traditionally been a local business since radio signals fade with distance and some information content (e.g. traffic and weather reports) is area-specific. There are approximately 5,000 AM and almost 9,000 FM radio stations in the U.S. The stations are distributed largely based on population. For example, there are about 50 AM-FM radio stations in New York City, the largest radio market in the United States. Smaller metropolitan areas such as Jacksonville, Louisville, and Oklahoma City typically have fewer than 30 AM-FM radio stations. While these cities are not among the largest 50 markets, they collectively account for over half of the U.S. population. Roughly 10% of the U.S. population lives in very small markets that receive five or fewer stations.[8]

Local radio stations compete directly with each other for demographically targeted listeners on the basis of transmitter range, on-air talent, and program content. Understandably, radio stations select personalities, artists, and content

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5. XM Radio 10-K 2000.
6. XM Radio 10-K 2000.
7. Based on DOT estimates, over 100 million people classify themselves as commuters; roughly 1/3 of them commute over 45 minutes one way, every day.
8. The Satellite Report 1999, C. E. Unterberg, Towbin, reported in XM 10-K 2000.

that appeals to the broadest market. So, even in what might appear to be a highly fragmented market, there is a natural tendency towards mass appeal formats. Almost half of all commercial radio stations broadcast news-talk-sports, adult contemporary music, Top 40, or country music. Add oldies, urban, and Hispanic formats to the mix, and over 70% of commercial radio is covered.

Since "over the air" broadcasts are free, stations derive revenue from advertising. A typical station runs 13 to 20 commercial minutes per hour. Anecdotal evidence indicates that the proportion of time allocated to commercials is increasing, especially in drive-time. Opinions vary widely as to radio's effectiveness as an advertising media since it lacks visual impact and is subject to extensive channel-switching. But, since formats are geared to listening tastes that tend to cluster demographically, radio is often used to target specific audiences. And, since radio is considered a relatively low cost media, it is often used to attain message frequency that enhances multi-media advertising programs.

The bottom line is that radio, in aggregate, is big business. Total radio ad revenues are approximately $20 billion annually, and have been growing at a rate of about 12% annually. Reflecting the local nature of the business, approximately 75% of all radio ad revenues are "local spot" advertising done by local merchants (e.g. car dealers, banks) and regional franchise cooperatives (e.g. McDonald's). The remaining ad revenue is premium-priced "national" advertising done by companies such as Coke and Budweiser.

Advertising rates, which are subject to intense negotiations, roughly correlate to estimated audience sizes. Demographically-specific station ratings (i.e. share of listeners) are projected from periodic listener surveys. Broadcasters actively attempt to "revenue manage" their finite inventory of highly perishable commercial spots—getting the highest possible prices for each spot, but leaving no spot unsold. Advertisers seek to get the best deals by aggregating large volume purchases, by capitalizing on competition between stations offering demographically-equivalent alternatives, and by opportunistically buying either at "up-front" discounts or at last minute "distressed" inventory prices.

Most recently, the radio business has been consolidating and "going national". Prior to 1996, when legal restrictions were relaxed, companies could not own more than 40 stations nationwide, and there were tight limits on the number of stations owned in any one market. Now, there is no nationwide cap and companies may own as many as eight stations in the largest markets, double the previous limit. A previously fragmented business, once made up of small local operators, evolved quickly into one dominated by large, publicly-owned companies—such as Clear Channel, Viacom, Cox Communications, and Infinity—that control stations around the country. According to the *Wall Street Journal*:

> No one took advantage of the new law more aggressively, or successfully, than Clear Channel. The company started out with one FM station in San Antonio. A relatively little-known firm before 1996, it rapidly grew into by far the biggest player on the airwaves. Today, it operates more than 1,200 U.S. stations … and is moving to exploit its size by linking up its different businesses and wooing major advertisers with the promise that it can deliver nearly any combination of geography, demographics and radio format.

Radio content is also becoming more national. Syndicators package programming with broad appeal (often popular personalities like Howard Stern, Rush Limbaugh, Dr. Laura) for simultaneous multi-market broadcasting. Chains like Clear Channel are also using technology and their enormous reach to transform the media into a national business. For example, using a practice called "voice-tracking", Clear Channel pipes popular out-of-town personalities from bigger markets to smaller ones, customizing their programs to make it sound as if the DJs are actually local residents.[9] And, Clear Channel tries to create national brands such as KISS FM—a standardized rock music format—that can become familiar names for both listeners and advertisers.

3. XM Satellite Radio

Again, XM's objective is to become a premier nationwide provider of audio entertainment by appealing to customers on the basis of clear sound quality from digital signal radios, virtually seamless signal coverage coast-to-coast, and an extensive variety of content. XM's 100 channels—of which 36 are free of commercials—offer music, news, talk, sports and children's programming tailored to a collectively large audience that includes urban and rural listeners of virtually all ages, and to specific high potential demographic groups. XM's in-house programming unit creates some proprietary programs; brand name programmers such as MTV, ESPN, Disney, CNN, and CNBC fill out the channel roster.

XM transmits its DARS (Digital Audio Radio Signal) throughout the continental United States from "Rock" and "Roll"—two high-powered GEO (Geostationary Earth Orbiting) satellites—and a network of terrestrial repeaters, which are generally ground-based towers that receive and re-transmit the satellite signals to areas where the direct satellite signal may be obstructed. (see Exhibit A below) Satellite radio is non-addressable - the same content is broadcast to all receivers, though some content may be electronically scrambled, requiring special decoding by individual receivers. And since its

9. "Perfecting the Art of Seeming Local", *WSJ*, 2-25-02.

DARS signal only goes one-way from the satellite to receivers, satellite radio is not directly interactive between broadcasters and listeners.

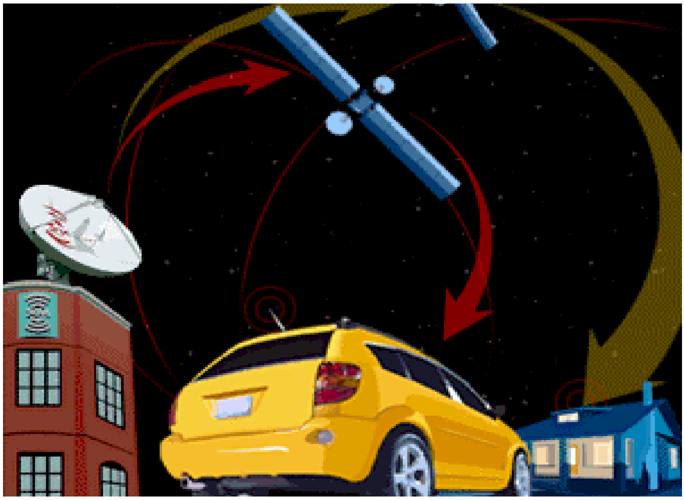
Exhibit A

XM Satellite Radio - Technology Overview

XM broadcasts radio signals to two geosynchronous orbiting satellites (GEOs) that rotate with the earth, maintaining a constant relative position and, with proper longitudinal separation, providing coast-to-coast coverage. The satellites relay the signals directly to special radio receivers, or to terrestrial ground repeaters.

Terrestrial repeaters supplement the coverage of satellites since, in some areas, satellite signals may be blocked by tall buildings and other obstructions. In some urban areas with a high concentration of tall buildings, these line-of-sight obstructions pose a particular problem. So, terrestrial repeaters—ground-based electronics devices—are installed on rooftops or existing tower structures, where they receive the satellite signals, amplify them, and retransmit them at significantly higher signal strength than is possible directly from the satellites. XM's repeater network in the largest urban markets includes more than 100 repeaters, while for smaller cities with fewer tall buildings there are as few as one to three repeaters.

Whether direct from the satellite or relayed from a repeater, the signal is captured by a system—programmed to "unscramble" the digital data signal—consisting of two parts: an antenna module and a receiver module. The antenna module is an active system with several elements that "look" along the horizon for the terrestrial signal, and in the sky for the satellite signal. The antenna module picks up the signals, amplifies them, filters out the noise and interference, and passes them on to the receiver module. The receiver module contains a chipset that converts the signal from 2.3GHz to a lower intermediate frequency, and then down to the digital base band. On the way down, the signal is converted from analog to digital. Within the digital domain, the signals are inspected for quality and optimized. The refined digital signal is then digitally filtered, the forward error correction is reversed, and the music is decrypted. Finally, the stereo digital audio is converted back to analog for delivery through the speakers.



Source: XM Satellite Radio web site

4. XM Distribution

To receive XM's signals, customers must purchase a special satellite radio (that also receives traditional AM and FM signals, and may be combined with a CD player).[10] XM radios are available under the Sony, Pioneer and Alpine brand names at national consumer electronics retailers such as Circuit City and Best Buy, Radio Shack, Sears, car audio dealers, and mass retailers such as Wal-Mart. XM works closely with retailers to train and motivate sales personnel, to provide collateral sales material (e.g. displays, signs. brochures), and to create and fund promotional campaigns (including incentives paid directly to retail sales forces).

By the end 2001, XM had established 3,500 distribution "points of presence" where XM radios could be purchased. During the Christmas 2001 selling season, 10% to 15% of all car radios sold at retail were satellite radios. Best Buy and Circuit City stores averaged "a couple" of XM sales per week, and collectively accounted for 60% of XM's initial "aftermarket" sales. Analysts expected XM to broaden its distribution base in 2002 to over 7,500 POPs—including a substantial rural presence.

XM also works closely with automotive manufacturers (OEMs) to promote rapid market penetration. For example, XM has a 12-year distribution

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10. As a frame of reference, radio manufacturers sold almost 30 million car radios in 1999: 60% were installed as original equipment in new autos, the remainder were sold in the so-called "aftermarket".

agreement with the OnStar division of General Motors for installation of XM radios in GM vehicles.[11] General Motors made XM radios available as a $295 factory-installed option in Cadillac Sevilles and Devilles in the fall of 2001, and announced that it will expand to over 25 additional models during 2002. XM representatives meet with GM dealers to educate them about XM Radio and develop sales and promotional campaigns to promote XM radios to new car buyers. While GM is not required to meet any minimum targets for installing XM radios, the company considers satellite radio to be an attractive add-on sale since XM subsidizes the cost of the radios and since the shared subscription fee provides a potentially lucrative annuity revenue stream. General Motors promotes XM radio as a special feature in its cars, wraps the price of the receiver and subscription into financing and lease contracts, and occasionally offers XM funded buying incentives such as free introductory subscriptions. GM has publicly projected that it will equip as many as 400,000 new cars with XM radios by the end of 2003. Currently, about 70% of consumers who buy GM cars equipped with XM radios activate the service. XM is continually in discussions with other car manufacturers to secure additional distribution agreements. In 2002, XM added Audi, Nissan, Infiniti, Volkswagen, and Isuzu to its OEM roster.

Also in 2002, XM entered into a joint marketing agreement with DIRECTV that provides XM with access to DIRECTV's distribution network (over 30,000 retailers) and its highly attractive customer base. DIRECTV has over 10 million subscribers, predominantly price-insensitive early adopters who are already familiar with satellite technology, and who often live in rural area where radio reception is sparse and XM's distribution is weakest.

Of course, in a highly competitive market, distribution is only part of XM's marketing challenge.

5. Competitive Environment

XM faces a plethora of established and prospective competitors vying for listeners and advertising dollars, including other satellite radio suppliers, Internet radio, Direct Broadcast Satellite (e.g. DIRECTV), digital cable, pre-recorded content (tapes and CDs) and, most notably, traditional AM / FM stations.

XM's most direct competitor is Sirius Satellite Radio, the only other FCC licensee for satellite radio service in the U.S. XM and Sirius broadcast in distinctive formats[12] from satellite infrastructures that are technically and strategically different. XM covers the U.S with 2 geostationary satellites.

11. In 2001, GM sold 4.9 million autos, which represented more than 28% of the U.S. market.
12. XM and Sirius have entered into selective cooperation agreements to promote a common satellite transmission standard.

Sirius has a more complex infrastructure: ultra-sophisticated receivers dynamically lock onto 1 of 3 satellites orbiting in figure-8's over North and South America. Due to lingering technical difficulties with its receivers, Sirius was forced to delay its market launch (until July 2002) and XM got an 8-month headstart.

Despite their current technical differences, the XM and Sirius products appear practically comparable to U.S. consumers. Both require the purchase of special receiver. XM runs some commercials on roughly one-third of its 100 channels, and charges $9.95 per month. Sirius also offers 100 channels, with all music channels commercial-free, for a slightly higher monthly charge ($12.95).[13]

Other media also compete with satellite radio. For example, digital cable and DIRECTV provide high quality audio that is often packaged with video service at no additional cost. But, these services must be co-located at fixed locations, mostly in homes or businesses, so their broadcasts are not available in cars.

Internet audio via WiFi connectivity is a potential threat, but there are current limitations with respect to sound quality and mobility. Although the current sound quality of Internet radio is below standard and may vary depending on factors such as network traffic, which can distort or interrupt the broadcast, improvements from higher bandwidths, faster modems and wider programming selection may make Internet radio a more significant competitor in the future.[14]

Satellite radio also competes against a burgeoning traffic in self-produced CDs with content "ripped" from commercial CDs or downloaded for free off the Internet. Napster-like peer-to-peer services reportedly handle over 2 billion music downloads per month.[15] Many listeners are simply "rolling their own" commercial-free music collections with extensive playlists specifically geared to their individual tastes.

Aside from downloaded music, XM's main competition is from Sirius and traditional AM-FM radio. Again, traditional AM-FM radio already has a well-established market for its services and generally offers free broadcasts that are funded by commercial advertising. And while traditional AM-FM radio stations currently broadcast analog signals that are lower quality than digital transmissions, in the future, they are likely to transmit digitally in expanded bandwidths.

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13. Both XM and Sirius charge activation fees; ranging from $10 to $15, the fees are often waived.
14. XM 10-K 2000.
15. As a frame of reference, only about 10 billion music tracks are sold commercially each year.

6. XM versus AM-FM

Recognizing the competitive realities, XM is trying to preempt a position as the leading provider of the next generation of radio by differentiating itself from traditional AM-FM radio.

In summary, XM claims several benefits versus AM-FM, including: (see Exhibit B opposite for a more complete list of differentiating factors)

- Greater signal coverage: seamless across the U.S.
- More variety: 100 channels, some proprietary content.
- Higher quality: superior digital transmission.
- Fewer commercials: averaging 6 minutes per hour.
- More information: text displaying song and artist.

Of course, the benefits come at a price. From a content perspective, XM lacks local sports, weather, news, and traffic that may be of critical interest to listeners, especially commuters. From an economic perspective, consumers must pay a few hundred dollars on the front-end for equipment and activation, and then must pay $120 annually for a service that is traditionally free.

There are examples—notably subscription entertainment services in other media such as cable television and satellite television—that suggest consumers may be willing, especially in underserved markets, to pay premium prices for expanded programming choice or enhanced transmission quality. For example, as of December 2001, 69% of TV households subscribe to basic cable television, and 17.5% of TV households subscribe to satellite television. During 2001, DIRECTV—the dominant satellite TV provider—offered a "basic" programming package for $39.99 per month, and averaged over $58 of monthly revenue per customer (ARPU).

Exhibit B

XM versus AM-FM

XM differentiates itself from traditional AM-FM radio by:[16]

1. Providing music formats unavailable in many markets. With 100 channels, including 71 music channels, 29 news, talk and information channels, XM Radio offers many music formats that are popular but currently unavailable in many markets. Even major markets rarely offer a full complement of formats. XM offers many types of music with significant popularity, as measured by recorded music sales and concert revenues that are unavailable in many traditional AM-FM radio markets. Such music includes classical recordings and popular blues and rap music that have retail appeal but are not commonly played on traditional AM-FM radio. XM has channels devoted to popular musical styles that are not currently heard in many small and medium sized markets, such as heavy metal, modern electronic dance, disco and blues.

   Further, the small number of available programming choices means that artists representing niche music formats are likely receive little or no airtime in many markets. Radio stations prefer featuring artists they believe appeal to the broadest market. However, according to the Recording Industry Association of America, recorded music sales of niche music formats such as classical, jazz, movie and Broadway soundtracks, new age, children's programming and others comprised up to 21% of total recorded music sales in 2000.

2. Creating new and exclusive programming. Capitalizing on a talented staff of over 200 program developers, XM has created several original channel formats with content focusing on popular music such as oldies, rock and country, and on new and innovative formats, including jazz, blues, reggae and pop classical. These formats include artists with strong music sales and concert revenue who do not get significant airplay on traditional AM-FM radio stations.

16. Adapted from XM 10-K 2000.

Exhibit B (continued)

3. Branding individual channels to create a specific station personality and image. XM uses compelling on-air talent and other techniques to attract listeners in the target market segments, including shows from Quincy Jones and Wynton Marsalis. Also, XM hires and develop high profile talk and disc jockey talent capable of becoming the next generation of national radio stars with an influence on radio similar to the impact that the new breed of cable TV talk hosts has had on the television industry.

4. Complementing its original programming with a variety of unique and diverse content supplied by brand name programming providers, including Bloomberg, Fox News, NASCAR, CNBC, BET, ESPN, MTV, the Weather Channel, and Radio Disney.

5. Super-serving popular music formats. XM radio offers more specific programming choices than is generally offered by traditional AM-FM radio for even the most popular listening formats. For example, on traditional AM-FM radio, oldies music is often generalized on a single format. XM segments this category by offering several dedicated, era-specific formats. Similarly, XM also offers seven channels dedicated to urban formats and five distinct country music formats.

6. Using more extensive playlists. Traditional AM-FM radio stations frequently use limited playlists with artists and specific music targeted at the largest mass audiences. With its large channel capacity and focus on diverse formats, XM provides more variety to attract listeners dissatisfied with repetitive and/or limited playlist selection offered by traditional radio. For instance, instead of a single oldies station, XM has channels devoted to the music of each decade from the 1940s to the 1990s. In the rock genre, XM even has a channel dedicated to "deep tracks" not currently heard on rock radio stations.

7. Delivering a wide range of ethnic and informational programming. XM provides a variety of formats that target specific ethnic and special interest groups who are rarely served by traditional AM-FM radio. XM uses it national platform to aggregate geographically disparate groups through "affinity programming".

Exhibit B (continued)

8. Developing unique promotional opportunities with record companies, recording artists and radio personalities. Because of its nationwide coverage and resulting economies of scale, XM is able to deliver a variety of national promotions and events that would not be cost effective or efficient on a market-by-market basis through traditional AM-FM radio distribution.

9. Responding quickly when major music and cultural events occur. XM Radio programmers strive to respond quickly to changing musical tastes, seasonal music and emerging popular cultural events, such as Britney Spears, Elton John/Billy Joel and U2 tours, by providing listeners with extensive coverage utilizing its large channel capacity.

10. Taking advantage of digital's higher quality signal. There are several music formats that have strong demand but have been relegated to AM stations with weaker signals due to lack of available FM frequencies. By having specific channels dedicated to classic country, the 1940s and gospel, for example, XM provides superior sound quality to formats that are traditionally found only on AM stations.

11. Focusing on special demands of mobile listeners. A significant percentage of radio listeners, such as truckers, routinely travel through two or more radio markets on a frequent basis. These listeners may be attracted to a radio service with national coast-to-coast coverage. So, XM is trying to identify and target the listening demands of this audience and have arrangements to include the programs of popular trucking radio personalities (for example, Bill Mack, Dale "the Truckin' Bozo" Sommers and Dave Nemo) on "Open Road", a channel dedicated to truckers.

12. Making available commercial-free and limited-advertising channels. As demonstrated by the appeal of limited periods of non-stop music used by some traditional AM-FM stations, a significant number of listeners may be willing pay for a radio service that provides commercial-free channels and channels with reduced advertising. XM targets this audience with over 30 commercial-free music channels including popular music formats. In addition, XM's limited-advertising channels carry less than half the advertising spots of typical AM-FM stations.

Exhibit B (continued)

13. Concentrating programming efforts on listeners who are most receptive to innovative entertainment services, so-called early adopters, and new car buyers. According to research, adults 16-34 years old will compose a high percentage of XM's early adopters; so the company focuses a significant portion of its programming and marketing efforts to appeal to them. In addition, XM provides programming and targeted marketing specifically to appeal to other key market segments such as baby boomers who are 35-53 years old, seniors who are 54 years old and older, African-Americans, Asian-Americans and Hispanics.

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7. Other Revenue: Advertising

In addition to the subscription fee, XM generates revenues from sales of advertising time on some channels. XM is able to aggregate disparate groups of listeners in specific targeted demographic segments into potentially attractive national audiences. "XM Radio offers a new national radio platform for advertisers that solves many of the problems associated with buying radio advertising nationally on a spot or syndicated basis".[17]

XM has contracts with several advertisers, advertising agencies and media buying companies offering "charter advertising packages" at reduced introductory rates. Among the advertisers and agencies that have bought advertising packages are AT&T, Procter & Gamble, Allstate, Sears, Goodyear, Bayer, Radio Shack and J. Walter Thompson. To support its advertising initiatives, XM is working with Arbitron—the "currency" in radio media measurement—to develop ratings methodologies for satellite radio. While advertising is a second revenue stream, it is inextricably linked to the size and quality of the subscriber base. The more listeners XM reaches, the more advertisers are willing to pay for commercial spots.

8. Building the Subscriber Base

In June 1999, XM engaged Strategic Marketing And Research Techniques (SMART), a leading market research company and Dr. Frank M. Bass, the leading authority on the diffusion of new products and architect of the Bass

17. XM Radio 10-K 2000.

Diffusion Model,[18] to estimate the demand for satellite radio based on survey data and historical information.

Dr. Bass and the SMART organization had performed a similar study for DIRECTV in the early 1990's.[19] In that study, SMART projected—based on a survey of purchase intentions—that 32% of all TV households would eventually purchase satellite TV. For planning purposes, DIRECTV's management discounted the projected rate to 16%. By 2002, roughly 10 years after the forecast was made, satellite TV had penetrated 17.5% of all TV households.

To estimate the potential for satellite radio, SMART surveyed 1,800 people ages 16 and over. The study concluded that as many as 49 million people might subscribe to satellite radio by 2012, assuming a $9.99 monthly subscription fee and a radio price point of $150-$399 depending upon the type of car or home unit chosen. (see Exhibit C below) The study also anticipated that satellite radio would grow even faster than DBS.[20]

Exhibit C

	Satellite Radio Purchase Intent*					
Subscription Price ($/month)	Equipment (including installation)					
	free	$99	$199	$299	$399	$499
9.95	43%	34%	27%	21%	17%	12%
12.95	35%	33%	24%	19%	15%	10%
15.95	31%	30%	20%	16%	12%	8%
19.95	23%	22%	19%	13%	10%	7%

* Authors estimates based on multiple sources
Purchase Intent = Extremely or Very Likely to Buy

XM also commissioned SMART to conduct a study based on one-on-one interviews with over 1,000 licensed drivers ages 16 to 64 in ten geographically dispersed markets. The study concluded that approximately 50% of aftermarket radio purchases would be for AM-FM/satellite radio units with a

18. In essence, the Bass Model projects the speed and magnitude of market development by capturing the mathematical relationship between a technology's early adopters (innovators) and the more conservative followers (imitators).
19. Details of the forecasting procedure and results are reported in "DirecTV: Forecasting Diffusion of New Technology Prior to Launch", *INTERFACES*, May-June 2001.
20. XM 10-K 2000.

single-disc CD player. This assumed a radio price point of $399, a $75 installation fee and a $10 monthly subscription fee for the service.[21]

To build its subscriber base, XM adopted an aggressive, multi-faceted marketing strategy designed to increase awareness and demand among potential subscribers. When XM's service became nationwide in November 2001, the company kicked-off a coast-to-coast promotional campaign under the banner "Radio to the Power of X". The national advertising campaign—which featured some of the biggest stars in music—B.B. King, David Bowie and Snoop Dogg—debuted in nearly 3,000 movie theatres across the U.S. The full campaign included radio, magazines, newspapers, direct mail, outdoor, and online media, and promotional activities at retail outlets, concert venues, NASCAR events, and on the Internet.

XM reports that its Subscriber Acquisition Cost (SAC) has averaged roughly $130 per subscriber. Some skeptics question whether XM's estimates are fully inclusive of marketing costs such as equipment subsidies paid to the auto companies.[22]

Throughout 2002, XM continued building awareness through national and local advertising programs, and via promotional activity aimed at consumers and distributors. XM's total sales and marketing budget for 2002 was heralded to exceed $100 million.

As of mid-2002, XM had about 135,000 subscribers. To spur a faster rate of subscriber growth in the second half of the year, XM implemented a multi-pronged offensive that included:

- Deepening the commitment to GM, which agreed to factory installation of XM receivers in an increasing number of makes and models, from Cadillacs to Cavaliers, and which began joint TV advertising with XM.

- Broadening the distribution base by making XM a dealer-installed option with a reported 10,000 independent new and used car dealers.

- Increasing "sampling" by installing XM receivers in 50,000 Avis rental cars, and making the service available in the equipped rental cars for $2.99 per day.

- Subsidizing initial installations by offering dealer incentives, free installation programs, and waived activation charges.

21. XM 10-K 2000.
22. As a frame of reference, DIRECTV reported at a Lehman Bothers Technology Forum in May 2002 that it has "reduced SAC significantly … bringing it down from a high of $575 to about $525".

- Offering lower prices on units bought directly from XM. For example, the company offered a reduced price "friends & family" program, with "friends" broadly defined to include anyone who had logged on the XM website.

- Announcing new proprietary content, including the Playboy Channel (available for a premium subscription rate), and Baron's Weather Services, offering near real-time reports to aviation and nautical audiences.

- Launching a relatively low-priced "plug & play" receiver called SKYFi from Delco. SKYFi could be used in cars, or as part of a "boom box" combination that had an internal antenna and was truly portable.[23]

Taking the aggressive initiatives into consideration, industry analysts projected that XM would have a base of 350,000 to 450,000 by the end of 2002, and over 1 million by the end of 2003.

XM's management touted the first-year adoption rate as being faster than any other consumer audio product introduced in recent history, and reported that progress was on plan. But, many industry observers were skeptical of management's public optimism, especially in late 2002 when the company announced a broad round of layoffs that included the Director of Customer Acquisition.

On December 23, 2002, XM announced a complex $450 million financial restructuring package that, the company said, represented "full funding through cash flow breakeven" in mid-2004.[24] The next day, Standard & Poor's lowered XM's corporate credit ratings to 'CCC-' from 'CCC+', having concluded that the refinancing plan substantially diluted investors' equity shares and was "tantamount to a default" for secured debt holders.[25] XM's stock, which hit an all time high of almost $50 in mid-2000, ended 2002 under $3.

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23. The basic SKYFi receiver was priced at $129. A required car installation kit—which included the cradle and antenna—was priced at about $70. The boom box was priced at $229 complete, or $99 without the SKYFi receiver. So, a subscriber could buy a single SKYFi receiver, a $70 car installation kit, and a $99 boom box, and be able to listen to XM in or out of the car.
24. Reuters, December 23, 2002.
25. Standard & Poor's credit analyst Steve Wilkinson, reported in Reuters, December 24, 2002.

APPENDIX

Exhibit 1

XM's Channel Line-up

Channel Name	Description	Channel Name	Description
XM Preview	XM Preview	Latin	
		Aguila	Spanish Top 40
Decades		Caricia	Spanish Pop Hits
The 40s	Forties/Swing	Vibra	Rock in Spanish
The 50s	Fifties	Tejano	Tejano
The 60s	Sixties	Caliente	Caribbean
The 70s	Seventies		
The 80s	Eighties	World	
The 90s	Nineties	World Zone	World Music
		The Joint	Reggae
Country		Ngoma	Music from Africa
America	Classic Country	Audio Visions	New Age
WSIX	Nashville Country	Radio Taj	Hindi - Indian
X Country	Progressive Country	C-Wave	Chinese Programming
Hank's Place	Traditional Country		
Bluegrass Junction	Bluegrass/Folk	Classical	
Highway 15	Nonstop Country	XM Classics	Traditional Classical
		Fine Tuning	Pop Classical
Hits		Vox!	Opera
20 on 20	Top 20 Hits	XM Pops	Classical Hits
KISS	LA Rock		
MIX	Pop Mix	Kids	
The Heart	Love Songs	Radio Disney	Children
Lite	Soft Rock	XM Kids	Children
MTV Radio	Rock/Pop		
VH1 Radio	Rock/Pop	News	
Cinemagic	Movie Soundtracks	XM News	Top Story News
On Broadway	Showtunes	USA Today	News
U-Pop	Euro Chart Hits	Fox News	News
Special X	Special Topics	CNN Headline News	News
The Torch	Christian Rock	The Weather Channel	24 Hr. Weather Network
The Fish	Christian Pop		
On the Rocks	Cocktail Mix		
Ethel	Alternative Hits		

XM's Channel Line-up

Rock	
Deep Tracks	Deep Album Rock
Boneyard	Hard Rock
XM Liquid Metal	Heavy Rock
XMU	New Rock
Fred	Classic Alternative
XM Cafe	Modern/Soft alt.
Top Tracks	Classic Rock Hits
The Loft	Acoustic/Folk
XM Music Lab	Progressive/Fusion
Unsigned!	Emerging Acts
Urban	
Soul Street	Classic Soul
The Flow	Urban Top 40
BET Uptown	Uptown Urban
Spirit	Gospel
The Groove	Old School R&B
The Rhyme	Classic Rap
RAW	Uncut Hip Hop
Jazz	
Real Jazz	Traditional Jazz & Blues
Watercolors	Contemporary Jazz
Beyond Jazz	Modern Jazz
Frank's Place	Great Vocals/Stds.
Bluesville	Blues
Luna	Latin Jazz
Dance	
The Move	Modern Electronic
BPM	Latest Hot Music
Club 82	Urban Mixes

CNBC	Business News
CNN fn	Financial News
Bloomberg	News and Business
CNET Radio	Tech News
BBC World Service	World Affairs
C-SPAN Radio	US Gov't/Public Affairs
CNN en Espanol	News in Spanish
Sports	
ESPN Radio	Talk/Play-by-Play
ESPN News	Sports News
Fox Sports Radio	Sports News Talk
The Sporting News	Sports Talk
NASCAR Radio	Automotive/Racing
Comedy	
XM Comedy	Comedy
Laugh USA	Family Comedy
Extreme XM	Comedy
Discovery Radio	Health/General Science
E! Entertainment Radio	Entertainment News
ABC News & Talk	News and Talk
Ask!	Experts Talk
Buzz XM	Hot Talk Stars
BabbleOn	Young and Sassy Talk
Open Road	Trucker's Channel
The Power	African American Topics
FamilyTalk	Christian Talk

Summary: Music (71 channels), Talk (29channels)
Channel listing as of August 2002

Exhibit 2

	XM Projected Subscribers (thousands at end of year)			
	Retail	New Cars	In Home	Total
2001	28	0	0	28
2002	382	61	0	443
2003	1,063	353	48	1,464
2004	2,088	1,037	222	3,347
2005	3,233	1,996	611	5,840
2006	4,258	4,826	972	10,056

Source: Lehman Brothers Equity Research 2-14-02

Exhibit 3

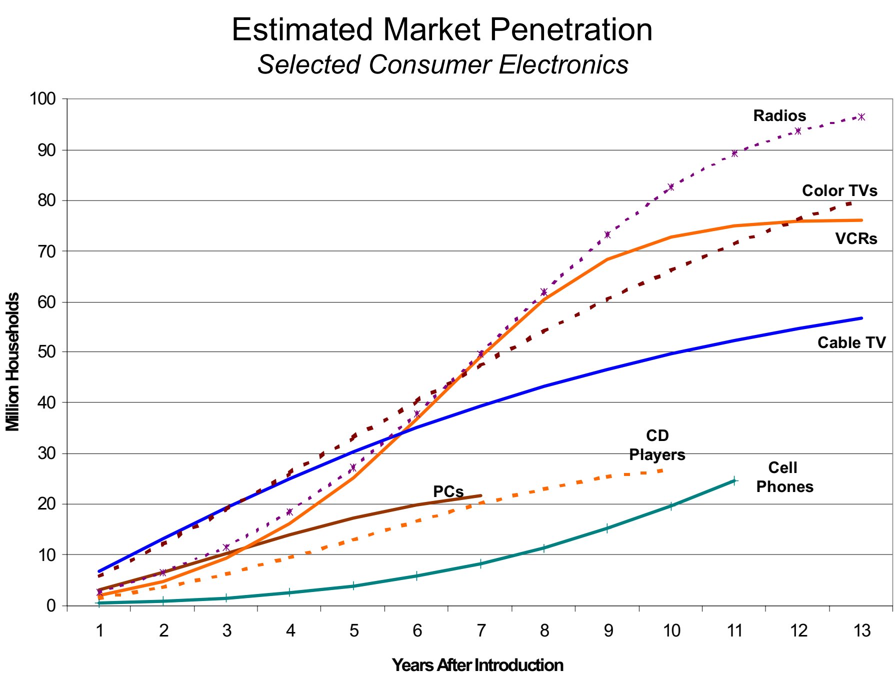
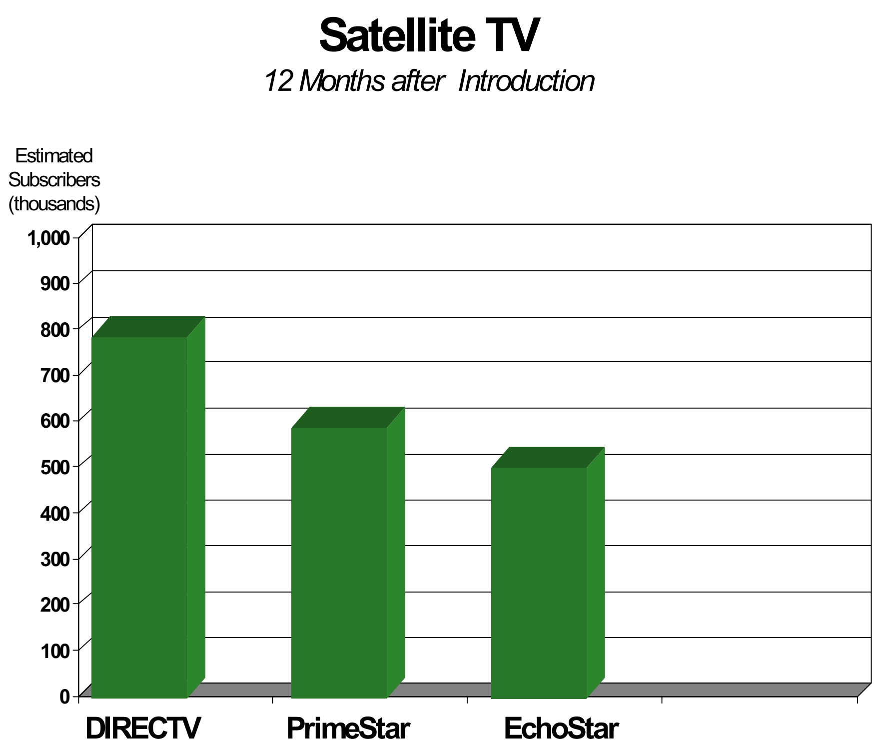


Exhibit 4



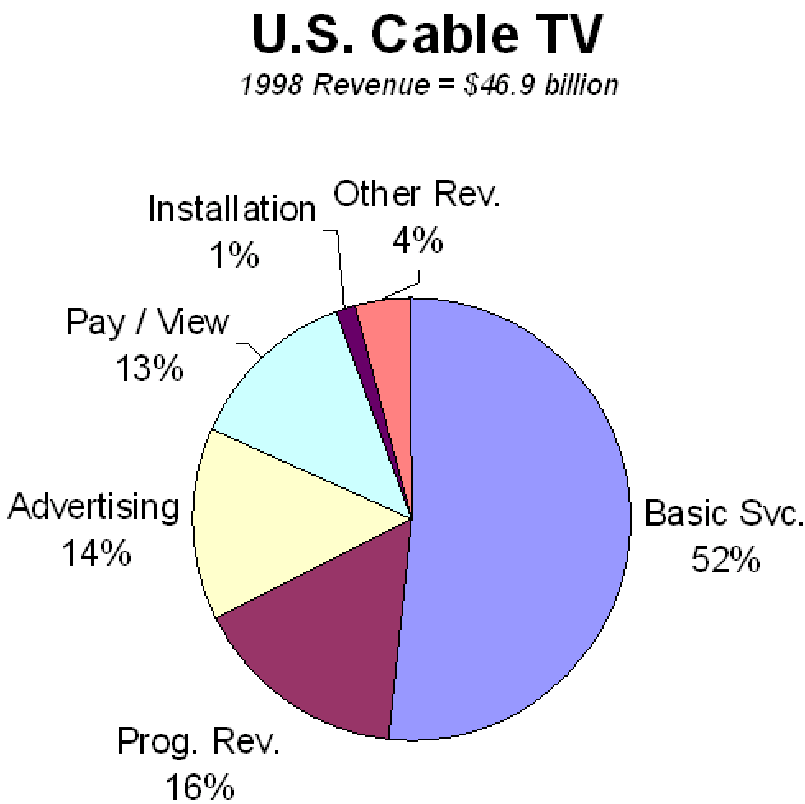
Source: Lehman Brothers Analyst Report

Exhibit 5

	XM - Financial Projections				
	2002	2003	2004	2005	2006
Revenue:					
Subscriber	20,597	105,986	279,507	547,477	974,101
Activation	879	3,958	10,174	19,438	33,187
Advertising	3,219	19,707	59,680	128,745	237,909
Total Revenue	24,695	129,651	349,361	695,660	1,245,197
Operating Expenses:					
Content/Programming	58,566	51,412	66,559	89,952	126,574
System Operations	49,379	50,372	51,617	53,050	54,698
Customer Service	6,866	31,124	68,609	120,544	192,100
Sub. Acq. Costs	55,516	146,412	224,940	254,519	408,564
Other Sales & Mktg	100,683	98,096	152,381	137,669	183,382
Sub-total	271,010	377,416	564,106	655,734	965,318
Gen'l & Admin.	26,533	23,559	24,274	25,010	25,769
R&D	6,917	4,988	5,140	5,296	5,456
Sub-total	33,450	28,547	29,414	30,306	31,225
Total Op. Expenses	304,460	405,963	593,520	686,040	996,543
EBITA	(279,765)	(276,312)	(244,159)	9,620	248,654
Depr & Amort	90,041	92,805	93,577	95,026	97,263
Op Income (EBIT)	(369,806)	(369,117)	(337,736)	(85,406)	151,391
New Subscribers	415	1021	1883	2493	4216
SAC per New Sub	$133.77	$143.40	$119.46	$102.09	$96.91

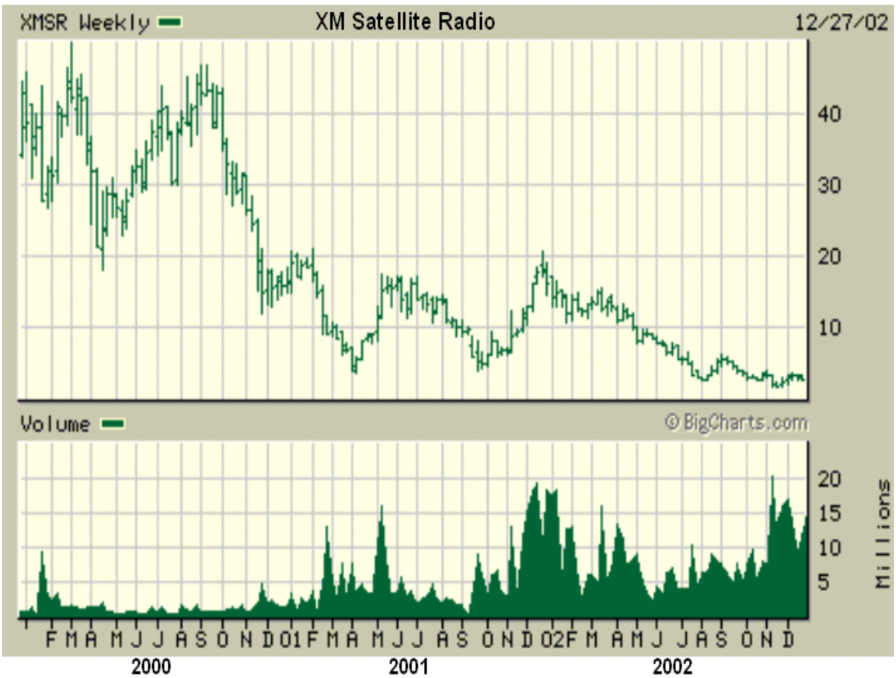
Source: Lehman Bothers Equity Research 2-14-02

Exhibit 6



Source: Statistical Abstract of the U.S. 2000

Exhibit 7



Source: Fidelity Online