



Nitin Sacheti

Portfolio Manager, Papyrus Capital



ECHOSTAR[®]

P A P Y R U S
C A P I T A L

Best Ideas 2019
Hosted by MOI Global

January 3, 2019

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- Long-biased long/short equity fund, launched in January 2016, investing in mispriced securities primarily in developed markets

- Continuation of process developed over Nitin's 13 year investment career at Tiger, Cobalt and Charter Bridge

- Three Buckets of Exposure
 1. Majority of long portfolio invested in Well-Managed Longs run by high quality owners/managers at attractive multiples with predictable cash flow and long time horizons
 2. Long book layered with Opportunistic Longs in shorter term, higher return opportunities at very attractive multiples
 3. Small short book consisting of single name, absolute return alpha shorts in structurally broken businesses

- Industry focus in mainly the telecom, media, technology, consumer, industrials and real estate sectors

- Intrinsic value approach, emphasis on predicting a business's cash flows over the life of the business vs. short-term stock price moves

- 100% locked up capital to align investor temperament with our own

THE PERFECT PLATFORM LONG

- **High Quality Owner/Manager**
Charlie Ergen knows the satellite business, identifies key trends years ahead of others and buys great assets with asymmetric rewards
- **Positive Secular Trends**
Participation in broadband and 5G growth through specialized satellite IP
- **Smart Capital Allocation**
Reinvestment of cash flows into new businesses with extremely high returns
- **Attractive Multiple**
High single digits earnings multiple on the predictable core business while paying nothing for the hidden assets

PREDICTABLE CORE BUSINESS AT AN ATTRACTIVE PRICE

SATS operates three core businesses

- **KA-band satellite broadband** – operates in a rational duopoly, selling broadband services to rural households and airlines with an IP protected product offering the lowest cost per bit in the industry
- **Fixed satellite business** – sells capacity for satellite TV service under long term contracts
- **Enterprise managed services** – offers connectivity to businesses in rural areas with no other connectivity options

Core is worth \$88/share or 146% upside!

MULTIPLE HIDDEN ASSETS OFFER EXCEPTIONAL RISK / REWARD

SATS also offers three free options, unappreciated by the market, with significant upside

- **Ka-Band Future Value** – Ka-Band IP is worth a lot through strategic pursuits
- **Brazil** – Broadband and TV satellites in Brazil to monetize
- **Dish Mexico** – Fast growing satellite television business in Mexico, JV with great distribution
- **Solaris Europe** – SATS acquired a satellite company with spectrum it hopes to lease or sell, offering a very high return

The hidden options at SATS are worth an additional \$108, offering 446% total upside

- Stock price has dropped from **\$59.90 on 12/31/2017 to \$36.72 on 12/31/2018 or 39%**
 - 3 hedge funds (all page 1 holders) closed down and liquidated their stakes, hastily
 - 1 mutual fund (number 1 institutional holder) received significant redemptions and liquidated its stake, abruptly
- Revenue up from \$1,886m in 2017 to an estimated \$2,140m in 2018
 - DISH revenue exposure down from 24% to 18%
- EBITDA up from \$795m in 2017 to an estimated \$911m in 2018 (15%!)
 - Hughes EBITDA up from \$475m in 2017 to an estimated \$628m in 2018 (32%!!)
- Hughes subscribers have increased from 1.2m at the end of 2017 to 1.4m estimated at the end of 2018
- JV with Yahsat to provide Jupiter class consumer broadband in Africa, ME and parts of Asia
- Continued success in South America with 2 Ka-band payloads and service in Brazil, Colombia, Peru and several other South/Central American countries
- Jupiter 3 under construction with anticipated service launch in 2021 at over 100mbps!
- Stock buyback initiated in Q4 2018
- Failed bid to acquire Inmarsat, though they are likely to come back to the table
 - Consolidates S-band spectrum in Europe
 - Increases SATS Ka-band orbital slots around the world
 - Scale/synergies from integrated SATS Jupiter IP into Inmarsat GX constellation along with consolidating inflight broadband businesses



Charlie Ergen

Charlie founded Dish Networks in 1980 with \$500k in savings. The business (including EchoStar) has a market capitalization of \$35 billion and Charlie has a net worth of ~\$20 billion

1. DBSD/Terrestar Spectrum Investment

- Charlie acquired bankrupt satellite spectrum in 2012, petitioned the government for the right to use it wirelessly and is currently in the process of monetizing the spectrum by building a wireless broadband network
- Charlie bought the spectrum for \$2.9bln in 2012, it's worth \$30bln today and likely \$50bln in 3-5 years

2. Sirius Distressed Investment

- Charlie acquired Sirius debt in 2008/2009 with the intention of forcing the company into bankruptcy to control the equity
- Charlie owned about \$500~600m in debt that would have given him control of the company post reorganization
 - John Malone swooped in to White Knight Sirius but had Ergen been successful, he would have owned a large percentage of Sirius's current \$21bln+ equity value

Charlie risks a small amount of capital with some downside protection for massively asymmetric payouts

He knows the satellite business better than anyone, which combined with his strategy yields arguably the best capital allocation in the public markets

Some of the Best IP in Telecom – Ka Band Satellites

- The Ka-Band satellite technology is the crown jewel at Echostar
- A technology shift has occurred over a few years, where high-throughput Ka-band offers 10x capacity for the same construction costs as legacy Ku-band satellites – i.e. 1/10th the cost per bit
- **CONSUMER BROADBAND: Highspeed broadband to consumers in rural areas with limited access to DSL/cable broadband**
 - Higher speeds of 25mbps vs. DSL/dial-up competitors at 1mbps means more customers are subscribing to satellite broadband

- Currently SATS offers service in North America with limited service in Brazil and Colombia

- Echostar and competitor Viasat's combined 4 satellites can serve 4m customers (though some capacity will be used in Mexico/Canada and for other services including in-flight broadband)
- The FCC estimates that the market size is about 20m unserved/underserved households in the US, alone
- Very minimal South American capacity vs. large TAM (given lower quality cable pipes, they are competing in cities for customers, too)

Year	Subs	Revenue	FCF
1	200	144	40.9
2	400	288	64.3
3	600	432	129.8
4	800	576	167.3
5	1,000	720	204.7
6	1,200	864	354.5
7	1,200	864	354.5
8	1,200	864	354.5
9	1,200	864	354.5
Initial Capx	500		
IRR	27%		

- They have only scratched the surface as it relates to worldwide consumer broadband demand

- Potential new consumer broadband satellites in Africa, South Asia, China...etc

Some of the Best IP in Telecom – Ka Band Satellites

- **5G WIRELESS – Massively Changing Landscape**
 - What is 5G – in a nutshell, an ultra-fast wireless standard that requires a densified network – i.e. more wireless towers along with small cell wireless towers attached to lampposts and in buildings
 - 5G is all about backhaul – when we densify wireless networks with so many more radios, we need to ‘trunk’ that data back through to the datacenters
 - Trunking is accomplished through fiber/cable in large cities and satellite in rural areas
 - Given their cost per bit advantage in Ka-band, we could envision an entire fleet of Echostar satellites across the world trunking capacity in rural areas
 - 2 Jupiter Ka-band satellites handling consumer broadband in the US, but we could see 10-20 built across the world over time
- **INFLIGHT – Fastest Speeds**
 - In-flight speeds using Ka are much faster than substitute products that use ATG and Ku
 - Large and growing market as new satellites are built across regions with aircraft traffic
- **Competition**
 - The only competitor in rural areas, DSL/dial up, is not improving while we are seeing Moore’s Law related cost per bit declines in Ka-band satellites

The difficult to re-create IP, rational duopoly and limited competition/substitutes ensures Echostar will continue to generate significant free cash flow/growth from Ka-band

Unlevered IRRs above 25% with significant reinvestment opportunities – faster than they can build, themselves – therefore, partnerships worldwide

(2) FIXED SATELLITE SERVICES

Operates a fleet of satellites for Dish, Bell Canada, Dish Mexico and the government. Mainly used for broadcasting satellite television

- Multi-year contracts with annual price escalators
- Shift to 4K from 1080p means increased demand on satellites despite flat/declining satellite television subscribers
- Limited negative effects of cord-cutting since TV satellites offer point to multi-point service
- Good, stable business with limited risk but also very little growth
- Rational competitive environment in North America

(3) ENTERPRISE SERVICES

Offers connectivity to businesses in remote areas utilizing Echostar's satellite fleet

- Extremely rural customer footprint – all Getty gas stations outside cable/DSL footprint that need instant connectivity to process credit card transactions
- 99% customer retention rate given limited competition/substitutes
- Low growth business with GDP-like price escalators
- Solid international footprint offering higher growth rates in emerging markets

Free Options – (1) Solaris European Spectrum

With the advent of smartphones, users are consuming more bandwidth on their phones each year, straining the medium by which the bandwidth is transmitted, spectrum.

As wireless operators scramble to offer higher speeds to consumers, the value of spectrum, a finite resource has continued and will continue to increase

- Echostar purchased Solaris, a satellite spectrum JV for \$175m in early 2014
- Similar to Dish in the US, Echostar is in discussions with regulators across the EU to repurpose this spectrum for terrestrial use

1. Scenario 1 – Wholesale LTE Network

- Should Echostar receive approval from all EU regulators, they can deploy a wholesale LTE network worth **\$29/share**

2. Scenario 2 – Satellite Radio Network

- Should Echostar not receive full approval, worst case, they can launch some combination of a satellite radio network with a wireless network

Satellite Radio

Year 5 Subs	5
E/Sub	500
EV	1,650
Per Share	\$19

Wholesale LTE

Spectrum	8
Downlink	50%
Bitz/Hz	3.7
Capacity/Radio	14.8
Radios/Site	3
Capacity/Tower	44.4
Towers	50,000
Capacity Create	2,220,000
GBps	271.0
Utilization	8%
Annual GBs	683,690,625
Lease per GB	\$0.75
Annual Revenue	513
Margin	50.0%
OCF	256
Value at 10x	2,564
Per Share	\$29

Any way you look at it, Solaris offers significant hidden upside for SATS!

(2) DISH MEXICO

49% stake in Dish Mexico estimated to have ~4 million subscribers and growing at double digit rates

- Dish Mexico is unconsolidated and not distributing any cash flow to Echostar, hence analysts ascribe it no value
- With the recent launch of Jupiter 2, Echostar's consumer broadband satellite, Dish Mexico will begin offering consumer broadband, hence a double play to grow its sub base
- Changing media laws in Mexico are a boon to Dish Mexico's offering a more robust channel lineup

(3) SOUTH AMERICA

Future television/broadband service similar to Dish Mexico

- Echostar recently purchased an orbital satellite and moved a TV satellite to Brazil
- They also launched a Ka-band payload to offer consumer broadband in Brazil
- Broadband service in Brazil is growing very quickly and they are likely to set up a wholesale FSS service with a local satellite television provider for service with their TV satellite

(4) Ka-Band Future Value

As previously discussed, the real hidden value lies in the IP in their Ka-Band satellites. However, we do not know exactly how this might be realized

- ACQUISITION: SATS may acquire an operator with global distribution and relationships but inferior satellite technology, through which SATS will 'plug in' its Ka-band IP
- JVs: SATS may set up JVs with foreign operators – rumored JV with AsiaSat, 1135 HK, one of two commercial satellite operators with landing rights in China. India JV also speculated.
- SATELLITE BUILDS: SATS has \$30 of gross cash/share on its balance sheet which it may use to simply build more satellite

WHAT IS IT WORTH

Core Business	EBITDA-		Value
	Capex	Multiple	
FSS Business	129	12.0x	1,544
Hughes	529	14.0x	7,401

Enterprise Value	8,945
Net Debt	361
Market Capitalization	8,584
Core Business Value Per Share	\$88
Upside	146%

Free Options	Value	Prob	Prob Adj
	per Share		Value
Ka-Band Future Value	\$59	90%	\$53
Brazil	\$10	75%	\$8
Solaris	\$49	75%	\$37
Dish Mexico	\$11	100%	\$11
Total Free Option Value			\$108

Total Company Value	\$197
Upside	446%

WHY DOES THE OPPORTUNITY EXIST

- Aforementioned forced selling
- Significant competitive destruction in the satellite space
 - Related to both technology and geographical exposure
 - Takes A LOT of work to realize the IP SATS has
- Limited Disclosure/Communication
 - The company is coy in disclosing future business strategies and monetization of free options
- Reinvestment of Cash Flows Obscures Earnings Power
- Company has been slow to deploy excess cash

CATALYSTS

- Dominoes begin to fall before 5G standards adopted
 - Should result in strategic actions
 - Company could be a buyer or seller
- Continued cash flow and subscriber growth in Hughes/Jupiter 2
- Approval of Solaris terrestrial spectrum rights by EU
- Stock buyback

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CONTACT US

Papyrus Capital LP

info@papyruscapital.com

1285 Avenue of the Americas
New York, NY 10019
(212) 205-4198