

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot



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Table of Contents

Introduction	4-5
Initial Setup and Testing	6
VoIP Basics	6-9
Cell Booster Requirements	9-10
Minimum Router Requirements	11
Wireless Home Phone (WHP)	11-12
ADT (Brinks) Home Security	12
WiFi Calling (WiFi-C)	13-14
Ethernet Conditions	14-15
GPS Lock	15-16
Initial Activation	16-17
Handing over	17-18
Technical Information/Signal Strength/ Signal Quality/AC Adapter	18-20
IMSI/IMEI	20-21
Connection Issues	21-27
Cell Booster Service Area outages	
Power Light	
Internet Light	
Status Light	
GPS Light/Antenna Notes	
4G/LTE Light	
Phone not connecting	
Dropped calls and/or call quality	

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

Vonage	
Miscellaneous	28-30
Purchasing a used unit	
Alternatives to a Cell Booster	
Summary of troubleshooting steps	
Quick Tips link	
Disclaimer/Additions/Changes	30-31

AT&T 4G/LTE Cell Booster™ Informational Document for
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INTRODUCTION

The information in this document is an update from the previous MicroCell Technical Guide to reflect the changes in the new femtocell. AT&T calls the SS2F11 a Cell Booster, and SB4IBN the Cell Booster Pro, but both are actually femtocells, the same as the previous models. This is a marketing decision by AT&T because the term cell booster is better understood by the customer base than the term femtocell, even though the term "Cell Booster" implies "Cellular Booster". The term Cell Booster/Cell Booster Pro may be used interchangeably with CB/CB Pro throughout this document to distinguish them from their predecessor, the MicroCell.

The AT&T Cell Booster is a very useful device when in-home cellular coverage is lacking or non-existent. However, its predecessor developed a love/hate relationship with some customers. The purpose of this document is to hopefully explain some of the technical workings of the Cell Booster which may help to explain why some customers may have problems with their Cell Booster's or their phones when attempting to connect.

The basic premise of the Cell Booster is that the device broadcasts a 4G/LTE signal inside your home that your phone connects to, just like a cellular tower, only the strength and propagation is very limited in comparison to a tower. That cellular signal then uses your wired internet connection to reach the AT&T Mobility Servers. There is no additional cost using the Cell Booster so your data usage would be the same as if you were connected to a cellular tower.

The Cell Booster and the Cell Booster Pro are 4G/LTE units. The Cell Booster Pro will be intended for Enterprise and First Responders (FirstNet). The Cell Boosters have a larger footprint than the MicroCell (but are square and flat), a WAN and LAN ports, an external antenna port (for GPS location), and will include the antennas. There are also holes on the back for hanging on a wall for the Cell Booster and there may be a wall mounting kit available for the Cell Booster Pro. Otherwise, as of this writing, the new models function similarly as the previous version, the DPH-154. The Cell Booster/Cell Booster Pro is manufactured by Nokia. At one time the Cell Booster was called the Nokia Smart Node and I think that's why AT&T chose Nokia for their second-generation femtocell.

The AT&T Cell Booster (CB) offers LTE coverage of up to 3,000 sq. ft. The AT&T Cell Booster Pro (CB Pro), offers LTE with coverage of up to 15,000 sq. ft. This document will focus primarily on the Cell Booster but will be applicable to the Cell Booster Pro for most of its operational and functional ability. The minimum bandwidth requirement will be 5Mbps down/1Mbps up for the Cell Booster and 25Mbps down/5Mbps up for the Cell Booster Pro. However, the recommended bandwidths

AT&T 4G/LTE Cell Booster™ Informational Document for
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for the Cell Booster will be 100Mbps/5Mbps and for the Cell Booster Pro it will be 150Mbps/20Mbps. Those numbers will vary so if the minimum can be met reliably, and depending on what else is sharing bandwidth on your home network, you should be fine.

The maximum allowable users at any one time for the CB will be 8, and for the CB Pro, 64.

The Cell Booster will allow any AT&T postpaid or prepaid phone, and IoT device to connect if within range. There will be no Approved Users List or allowing access via an AT&T phone number like there was with the MicroCell. And there will be no way, at least as of this writing, to know who is using your Cell Booster. Communication between the Cell Booster and AT&T is accomplished through a secure encrypted connection.

NOTE: Both devices have a consumer warning that you should be no closer than 20cm (8") and for no longer than one minute, including areas of short-term duration such as, but not limited to, a light, light switch, thermostat, HVAC unit or vent, electrical outlet, and signs.

The Cell Booster Pro is intended for Enterprise and First Responders (FirstNet) because of the increased RF coverage, 5G, the number of users allowed, and the bands used. There will also be a separate portal for Cell Booster Pro management and possibly a professional installation offered.

The Cell Booster is a totally closed system so there is no access to modify or change settings like you can with a router. Only AT&T can modify the system and does so on occasion with updates automatically pushed to the unit (usually in the middle of the night to avoid service interruption). There are no announcements of what the updates are for or when they will be pushed out.

The Cell Booster is primarily for voice. You can use it for data, but the speeds will be slower even though it uses 4G/LTE for throughput. Voice doesn't have the same bandwidth requirements that data does so if your download speeds are terrible on the Cell Booster and Cell Booster Pro, voice should still be fine. That's why the recommendation is to leave WiFi on if you plan to use data as well. That way, data will be downloaded via WiFi and voice will be handled by the Cell Booster. Your data usage will also not go against your data plan if you use WiFi.

The Cell Booster and Cell Booster Pro will both have an anti-tamper

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Version 3.0
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mechanism that will display an alert in the Cell Booster app and will permanently disable the unit if there is an attempt made to open the device.

The initial cost of the Cell Booster will be \$229 and for the Cell Booster Pro \$699.

Initial Setup and Testing

Xfinity cable (800/20), Motorola DOCSIS 3.1 modem, Netgear Orbi Mesh WiFi.

My current MicroCell (DPH-154) was setup for testing purposes (normally I use WiFi-C) by connecting it to a powered, 8-port gigabit switch with a 50' CAT5e cable. It was located upstairs along a NW facing wall below, and about 3' from a window. Port forwarding was not setup or needed. From setup to connection to our phones took about 20 minutes and covered our 3500 sq.ft. home completely. WiFi and WiFi-C was enabled on my iPhone 12 (iOS 15.3) with cellular set to LTE.

The Cell Booster (MFD 0821) was setup in the same way. There were some issues using the mobile app so I just used my laptop and accessed the setup page that way. WiFi-C appears to have no effect on the Cell Booster whether it is enabled or not. Signal strength seems to fluctuate a bit between 3 and 4 bars but connection stays solid. However, I would suggest leaving WiFi-C disabled in case of signal fluctuations between the Cell Booster and your WiFi which may result in call quality issues. Leave WiFi enabled though.

Initial registration to complete activation and usage was 70 minutes.

Moving the Cell Booster the following day to a West facing wall on the other side of the room was easy with no issues, and it was up and fully operational in less than 10 minutes.

SpeedTest indicates 504Mbps down and 18Mbps up, with WiFi enabled and WiFi-C disabled. 188Mbps down, 18Mbps up with WiFi/WiFi-C disabled. Wired speeds at time of testing were 796Mbps down, 18Mbps up. SpeedTest for video resulted in 1440p QHD (WiFi/WiFi-C disabled) with 0% buffering. QHD is Quarter High Definition. iPhone 12 (iOS 15.3).

VoIP BASICS

VoIP (Voice over Internet Protocol) is basically converting an analog voice communication to digital communication, which is then transmitted from one point to another by way of the internet. This is not easy and takes a considerable amount of technology and cooperation among the various service providers to get it to work without any issues. Most of the time, we just pick up our phones, make a call, and

AT&T 4G/LTE Cell Booster™ Informational Document for
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Version 3.0
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not even think about what is going on behind the scenes to place that call.

The key factors that affect VoIP are as follows:

Latency - this is the amount of time it takes a voice packet to get from your location to its destination over the internet and is usually measured in milliseconds (ms). The lower the latency, the better the call. High latency can cause calls to be dropped or affect the overall quality of the call. Causes of high latency can be many. Some may include the number of router hops (increases the danger of voice packets being incorrectly copied and sent thru), network congestion, low bandwidth, buffer management, data communication protocols (routing and switching), etc. Unfortunately, the end user has no control over these issues, and they can be on-going or temporary.

Jitter – this is defined as a variation in the delay of received packets. Data packets are sent as a continuous stream evenly spaced apart. Due to network congestion, improper queuing, or configuration issues, the steady stream may be interrupted such that the delay between each packet can vary instead of remaining constant.

When the router receives the RTP (Real-Time Protocol) audio stream, it has to compensate for any jitter that is encountered. This basically means that the RTP has to be buffered and then put back together in a steady stream to be sent to the DSP (Digital Signal Processor) and re-converted back to an analog signal. This buffer is either called the playout delay buffer or the de-jitter buffer.

If the jitter is too large to be buffered adequately, packets are discarded which results in audio dropouts. Sometimes the dropouts are not noticeable if the DSP can insert packets that it thinks should be there (predictive insertion). If they are too large, audio quality deteriorates, or the connection is dropped.

Jitter can only be fixed by your ISP.

Packet Loss – this is simply data packets that just get lost in transit. Not an uncommon event on the internet. Causes can include signal degradation, channel congestion, corrupted packets being rejected in-transit, faulty network hardware, faulty network drivers, or home network/wiring issues. Sometimes packet loss can be intentional by your ISP for operational management purposes.

Excessive packet loss can result in voice dropouts or loss of connectivity. Packets are transmitted using either TCP (Transmission Control Protocol) or UDP (User Datagram Protocol) protocols on specific ports designated by AT&T. The exact function of those protocols will not be discussed in this document.

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
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Insufficient Bandwidth – it's nice to have a 100Mbps download speed but that is rarely a sustained speed (100% of the time). It will vary for lots of reasons and are not guaranteed by your ISP (the term usually given is "up to"). Most of the time one is close to that but variations will occur with sometimes very drastic speed fluctuations. All of which can affect the CB voice quality and connectivity.

Your home network will also affect the bandwidth if you are sharing multiple devices that can all connect to the internet. There are various applications that you can use to test for latency, jitter, packet loss, and speed. But these only take snapshots at that point in time. To get a more accurate determination on what is going on with your network, these determinations need to be made over longer periods of time and compared to the times of day to ascertain high usage windows which may coincide with issues. Keep in mind that these are only "snapshots" for the time in which you run the tests, but it may give you some useful information. To assess your true line quality, you would need your ISP to perform these, or similar tests over a longer period of time:

The symptoms of poor line quality are as follows, and again, can only be corrected by your ISP:

Dropped Calls – calls may drop because of carrier related routing issues, but more often, calls drop because of packet loss related to failing or misconfigured network appliances. Insufficient bandwidth or other ISP related issues also might cause this.

Choppiness and Garbled Audio – These symptoms are related to firewall configuration or ISP connection issues. High packet loss and latency are often the culprits.

Robot or Underwater Sound – Firewall configuration and ISP issues can also cause these issues. The problem could be with the customer's network or WAN connection.

Activation Issue – An extension in the customer's firewall may be having issues traversing a NAT firewall. This is usually a rare incidence but a possibility.

1. Insufficient download speeds may impact inbound traffic including the ability to hear callers.
2. Insufficient upload speeds may impact outbound traffic, including the ability of callers to hear you.
3. Jitter measures the constant flow of data. A low jitter value shows a more consistent flow.
4. Packet loss measures internet connectivity and how accurately it is transferring data. Zero percent packet loss is desired for high quality VoIP.

AT&T 4G/LTE Cell Booster™ Informational Document for
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Bandwidth

Number of Concurrent Calls	Recommended Bandwidth
1	100 Kbps
5	500 KbPS
10	1Mbps
15	1.5Mbps
20	2Mbps

VoIP Pass Criteria

Ping: Under 100ms - Excellent connection

Under 250ms - Good connection

Over 250ms - Poor connection

Packet Loss: 0% (5% or less is desired)

Round Trip Time: <100ms

Jitter: <20ms (0-1ms radio quality, 1-5ms standard quality, 5-20ms broken sound)

Latency: <100ms

The criteria may change a little bit depending on the Data Center used for the test but basically, the lower the values the higher the line quality.

REQUIREMENTS

Active postpaid AT&T cellular account for registration and activation.

To get started, create an account by clicking on the appropriate link:

[AT&T Cell Booster](#)

[AT&T FirstNet Customers](#)

The Cell Booster is primarily designed and aimed for the in-home market as it requires a direct internet connection. It can be used for business connections but if your company has a firewall in you may encounter issues and you will need to work it out with your IT Department.

AT&T mobile phones that are 4G, LTE, 5G sub-6GHz, and 5G+ (mmWave) are the only handsets supported.

AT&T 4G/LTE Cell Booster™ Informational Document for
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Version 3.0
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An AT&T SIM card (for the phone).

The Cell Booster can work with any land-based (DSL, cable, fiber) internet service **EXCEPT SATELLITE, and possibly wireless broadband due to latency issues. That will probably include Starlink as well.** If you use satellite, wireless, or Starlink and encounter problems, you will have to take it up with that service because AT&T can't support those types of connections. Minimum download and upload speeds are 5Mbps and 1Mbps with low latency. However, I think for very reliable voice quality the download/upload speeds should be higher.

The Cell Booster must reside within an AT&T Cell Booster coverage area:

1. The location has to be within an area AT&T is licensed to have coverage.
2. The network (for call routing) in the area has to be configured properly for the Cell Booster.
3. All E911 services within the AT&T network have to be configured for Cell Booster use. E911 is an FCC requirement and is dependent upon the physical address where the Cell Booster is located matching the GPS coordinates.

Prepaid customers can use the Cell Booster but cannot "own" the AT&T Cell Booster device. In other words, the Primary Login ID used to register and activate the CB has to be a postpaid account.

The Cell Booster can support any phone as long as the phone meets the 4G/LTE requirements for service on AT&T and has an active AT&T account.

There is no monthly cost to use the Cell Booster.

You can have up to 3 Cell Booster's or Cell Booster Pro's on one account at a single location to extend coverage, but they have to be at least 50' to 100' apart.

NOTE: Apparently AT&T is offering an app for use with the Cell Booster as well. It appears to be for remotely accessing your Cell Booster account for management purposes. AT&T did the same thing with the MicroCell and it didn't work very well so they eventually dropped support of it entirely. Hopefully AT&T will do better this time around with this app and not depend on a third party to update and keep it current. The website may eventually include management options as well.

NOMINAL SETUP Gateway or Router (if you have a separate router and modem) -> Cell Booster (connect to the YELLOW WAN port)

Alternate Setup (for testing only to rule out router issues) modem -> Cell Booster (connect to the YELLOW WAN port). However, this may not work anymore with the Cell Booster due to the new design changes.

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
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The Cell Booster needs to be no more than 18" away from a window with an unobstructed view of the sky and at least 2' away from a WiFi source. GPS connectivity must be maintained at all times with the supplied external antenna.

MINIMUM ROUTER REQUIREMENTS

DHCP enabled

Ports that must remain open (public and private):

123/UDP - for NTP traffic and timing

4500/UDP - for IPSec NAT Traversal (for all signaling, data, and voice traffic).

500/UDP - for IPSec Phase I prior to NAT detection, after which 4500/UDP is used.

IPSec Pass-Through is enabled

Block Fragmented Packets is disabled

NAT duties handled by only one device if you have a separate router and modem instead of a gateway (modem/router combo).

Double NAT Workaround:

If you can't disable NAT on your router or modem you may be able to bypass it by port forwarding port 45631/TCP in your router to the DMZ. NOTE: this is really only a workaround for a double NAT as port 45631 is unassigned and is not guaranteed to work in all circumstances.

LAN Port

There is an LAN port as well which can be used for a computer and probably the Wireless Home Phone. In the past, the MicroCell did have a computer port but there were lots of issues with that so Cisco (the original MicroCell developer) and AT&T did away with it on the last iteration of the MicroCell. It would appear that they have worked out the issues. That being said, if you do connect a computer and have issues, there is probably very little that AT&T can do about because that would require messing around with the computer's configuration settings and, like a router, they are very reluctant to do that for obvious reasons.

WIRELESS HOME PHONE (WHP) - Model IFWA-40

The Wireless Home Phone (WHP) is a standalone device that allows the user to use a traditional corded/cordless handset to make calls. It uses the AT&T Mobility Wireless Network. If you have decent cellular coverage in your home, then the WHP

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
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will connect to the closest tower. If not, you can use the Cell Booster to make that connection.

It may help to think of the WHP as a cell phone. It is activated with a SIM card, is considered Mobility service, and appears as just another line on a customer's Mobility bill. Since WHP has no data or messaging capabilities, it won't impact the data usage for cellular plans. The WHP is not a VoIP device.

The current model of the WHP is the IWFA-40 model. The new model has not been tested thoroughly with the Cell Booster but it should work. It will include data and will work similarly to a Mi-Fi device in that it will provide the customer with their home internet. The Cell Booster is not compatible with wireless broadband.

The WHP is a closed device like the Cell Booster so there are no configuration options available. Without the use of the Cell Booster the Signal Strength LED will be solid green, yellow, or red to indicate the quality of the signal. When connected to the Cell Booster, the Signal Strength LED will blink green. To connect to the Cell Booster, via an ethernet cable, the WHP may have to have its phone number added to the Approved User List (if available) of the Cell Booster. The WHP has no keypad, touchscreen, or any other means of dialing a phone number or placing/receiving calls. It needs to have a corded/cordless phone plugged into it instead of having the phone plugged into a traditional phone wall outlet.

WHP call quality can be affected by the same factors that affect the Cell Booster call quality when the WHP is using the Cell Booster to make its cellular connection.

ADT HOME SECURITY

There were quite a few reports of the MicroCell interfering with the ADT Home security system. The answer was quite simple. ADT happened to use the same frequencies that AT&T did (850 MHz and/or 1900 MHz) so there was often interference when the ADT system and MicroCell were in close proximity. The frequencies allowed are dictated by the FCC license for that area and provider. There is nothing that could really be done other than keeping the MicroCell and ADT transmitter as far apart as possible (at least 50') but that is no guarantee that interference still won't occur. This can become very troublesome if you have a MicroCell and your next-door neighbor has an ADT transmitter on the same side of their house that your MicroCell is on. Whether that is still an issue now with spectrum changes and the AT&T Cell Booster has yet to be determined. AT&T owns the spectrum so ADT is the one who needs to comply or offer a transmitter that uses frequencies other than AT&T's 4G/LTE Cell Booster and/or Cell Booster Pro.

WiFi CALLING

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
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WiFi-C (WiFi Calling) is essentially offered for the same reason that the Cell Booster is. It is intended to patch holes in coverage, primarily in your home. It is not intended as a 100% replacement for cellular. The phone should connect to WiFi-C whenever cellular strength is weak/unsteady or non-existent and a stronger WiFi connection is present.

Originally, calls would not hand off from WiFi-C to the MicroCell because the MicroCell (which was a 3G cellular connection) could not “see” the WiFi call. This is due to network/technology structuring. That's why calls would be dropped if you were on a call that originated with one technology (WiFi) and then the signal changed to another technology (cellular) while still on the call.

So, if you are in a mixed environment (WiFi-C and femtocell), and want to use WiFi-C in home, your only option is to enable Airplane Mode to turn off the cellular radio and force the phone to connect to your WiFi network. AT&T will probably not change the preference for cellular over WiFi because they are selling a cellular service, not a WiFi-C service. However, if you leave WiFi-C enabled and move into an environment where the cellular signal is strong, i.e. the Cell Booster, your phone should connect to the CB without any issues (provided you're not on a call at the time) and you can continue receiving/sending calls as before.

WiFi-C works very well in most cases with calls being very clear and reliable and is the preferred method for improving poor in-home coverage. Depending on how your WiFi network is setup, you can walk around your house on a call and not get dropped. Of course, your mileage may vary. I leave WiFi-C enabled all of the time (we have friends who have poor in-home cellular), as well as WiFi, and have had zero issues when connecting to the old MicroCell (which was re-enabled for testing purposes) and hopefully the same is now true with the new Cell Booster. That being said, the RF signals are much stronger with the Cell Booster now so time will tell as more users try to keep WiFi-C enabled and use the Cell Booster.

The strength of the WiFi signal needed for successful calls is probably close to the same as it is for cellular calls. If the signal strength gets close to -90dBm calling may be iffy. At -95dBm to -100dBm or lower you will probably start to drop calls or lose them altogether. Any issues that affect your WiFi will affect WiFi-C so keep that in mind.

WiFi-C on AT&T's network uses ports UDP 500, UDP 4500, and TCP 143. UDP 500 and UDP 4500 are also used for the Cell Booster. When there have been port issues with the MicroCell's in the past, port 4500 seems to have been the culprit in a lot of cases so that may be true as well for the Cell Booster. So, if you experience Cell Booster issues and port 4500 is blocked, or is having issues, you may have WiFi-C

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

issues as well. If it's not a hardware malfunction of your phone, which only the mfr can correct, then it will be up to AT&T's Network Engineers to isolate and correct the port problem if AT&T is your ISP.

So, if you have good in-home WiFi, and your phone is WiFi-C capable, you don't really need the Cell Booster. However, if you are in a mixed environment or have issues with WiFi-C for various reasons, then the Cell Booster may solve your in-home cellular coverage.

Remember, you cannot hand off from WiFi-C to cellular (4G/LTE) and vice versa while on a call, and cellular will always be the preferred connectivity protocol when the signal is stronger and/or more stable.

Calls made over WiFi-C are treated like a regular call so you can call to any phone be it cellular or landline.

NOTE on WiFi Assist (Apple iPhones)

This is a feature that is enabled by default (at least it used to be). From Apple, "With Wi-Fi Assist, you can stay connected to the Internet even if you have a poor Wi-Fi connection. For example, if you're using Safari with a poor Wi-Fi connection and a webpage doesn't load, Wi-Fi Assist will activate and automatically switch to cellular so that the webpage continues to load. You can use Wi-Fi Assist with most apps like Safari, Apple Music, Mail, Maps, and more. When Wi-Fi Assist is activated, you'll see the cellular data icon in the status bar on your device. Because you'll stay connected to the Internet over cellular when you have a poor Wi-Fi connection, you might use more cellular data."

This may or may not cause issues with the Cell Booster. We recommend keeping WiFi enabled on your phone so that data is handled over your WiFi connection and voice handled over cellular. But with WiFi Assist enabled, there could be issues. So, if you are having issues, disabling WiFi Assist (which has nothing to do with WiFi-C) may correct them.

ETHERNET CONDITIONS

The Cell Booster needs to be physically connected via an ethernet cable to the router or gateway at all times. Powerline Adapters can be used but they may not work because house-wiring conditions can be variable due to age, installation, etc. Newer homes and condos may have pre-wired RJ-45 or 8P8C connectors in-wall. These should work but proper installation, which would be continuous length of wire (no intermittent adapters), type of wire used (twisted vs solid core), degree of wire bending, wall board nails touching the wire, and proper wiring to the connectors will all affect performance. The Cell Booster may be more sensitive to grounding and voltage fluctuations than a router is so any variation may cause the Cell Booster to

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
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lose connection intermittently and the only way to re-establish connectivity is to restart the Cell Booster and/or the phone. If you are using a wireless router and want to locate your Cell Booster in a different location in your home that prohibits hard-wiring it to your router, you may be able to use a wireless repeater next to the Cell Booster and hard-wire the Cell Booster to the repeater.

The Cell Booster does generate some heat at the back so give it plenty of ventilation and try not to put it in direct sunlight when placing it next to a window.

The Cell Booster can be used at locations other than your home (summer house for example) as long as the primary account phone number is the same, you change the address of the setup page to reflect the current physical location of the Cell Booster (for GPS confirmation and initialization), and your internet connection meets the requirements.

GPS LOCK

The Cell Booster needs to maintain a GPS lock at all times. This is for E911 services and for timing purposes to allow the data packets to synchronize between the Cell Booster and the nearest tower for handing off calls. Unless the Cell Booster has an improved embedded atomic clock over its predecessor, it will need to do this for timing the packets.

AT&T performs maintenance on their network on a random basis during the hours of minimal usage, usually very late at night or early in the morning. GPS location is verified by using the local tower and the NWL (Network Listen) protocol. If NWL fails for any reason, then the Cell Booster uses the standard GPS scan to confirm location. If that fails, connection is lost until it can be re-established by either rebooting or calling support if the reboot or deactivating/reactivating doesn't work.

GPS also allows the Cell Booster to choose which frequencies are licensed by AT&T that can be legally used in the area. Since the unit operates on the same frequencies as used by the towers, it must operate within the licenses owned by AT&T but these licenses can vary from region to region.

GPS signals are broadcast on a 1.5GHz channel which can be absorbed by wood and metal. So, moving the unit a couple of feet to either side of a window may make a difference in GPS lock. After Initial Activation, the external antenna need not be placed directly on or in front of a window, but the antenna needs to stay connected.

Speaking of E911 calls, any E911 call from a mobile device should be done with the complete 10-digit phone number, not just 911. The reason for this is call delay. On a landline, the 911 operator has your exact GPS coordinates instantly, and even if you

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
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can't speak, but leave the connection open, they can roll emergency vehicles to you immediately. Mobile devices and VoIP calls (**the Cell Booster is a VoIP device**) are usually routed first thru your local Highway Patrol or State Trooper's 911 dispatcher, and then that's routed to the local 911 operator. That's usually very quick but there can still be somewhat of a delay. The landline (voice) dispatcher has instant access to the GPS database for all calls, and mobile calls may not have the instant access like the landline operators do. Dialing the 10-digit number is the same as using a landline. This is getting better as more calls move away from landline and go to mobile, but it is something to consider for use in-home. The downside is that the 10-digit number is based on your area code and if you are out of your area code you have no choice but to dial 911.

INITIAL ACTIVATION

When the Cell Booster first boots up, the unit gets a DHCP license, syncs with network time over NTP, and then does a DNS query for xxxxx.wireless.att.com. Once successful, it talks to that server over HTTPS (TLSv1) for a while and then immediately starts an IPsec VPN with xx.xxx.xxx.193.

From AT&T: *The address where the cell Booster is physically located will be verified via the online registration process prior to use. If buildings, landforms, or other obstructions block satellite and/or cell tower wireless signals to the Cell Booster AT&T may be unable to verify the location of the device. If AT&T is unable to verify that the physical address of the device is located within an AT&T authorized service area, the Cell Booster will not remain in service*

Once that is established, the Cell Booster gets the GPS signal, confirms that with NWL, notes the local tower signal, and adjusts its internal transmitter power. At the same time it's updating any firmware changes it needs to do (that's why you may see it reboot a couple of times or take a bit longer to complete the activation process), building a handoff list of macrocells (towers) that are in range, and collecting information about which frequencies are active in proximity. The greater the received signal strength from the local tower, the lower the 4G/LTE transmitter power from the Cell Booster to your phone. The reason for this is so the Cell Booster won't interfere with the local tower signal. That's why if you are really far away from a local tower, your Cell Booster's transmission power will be increased with the resulting better reception on your mobile phone. However, the closer the tower(s) are, the opposite effect happens. **NOTE: The Cell Booster does not need a local tower for calls, only GPS lock, maintenance, and E911.**

To complicate matters, the individual mobile phones also adjust their transmission strength in relationship to what it receives from the Cell Booster and some phones are just better at this than others, hence the variability between phones when

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

connecting, and staying connected to the Cell Booster. For some phones, increased battery drain may be experienced because of this.

Changing the location of the Cell Booster in your house may alleviate any tower issues if you are in a particularly strong, or weak, area. Try to find the “sweet spot” if you can. This may work for some if you are having issues related to tower strength. Continuously re-starting the Cell Booster (power cycling) repeats the activation process detailed above, which shouldn’t change anything if you haven’t moved the Cell Booster to a different location, but that’s no guarantee that transmission power of the Cell Booster and/or mobile phone will stay the same.

It's a good idea if you power down your Cell Booster for any reason that when you turn it back on, and it's working (all LED's a solid white), to have your phone(s) close by so that they can get a nice strong signal that the phone can "register" as part of its cellular neighborhood.

HANDING OVER

There are basically two types of hand over that happens on cellular networks, soft and hard hand overs.

In soft hand overs, the phone is continually talking to multiple macrocells (towers) at the same time, so the transition is seamless because you are already connected and communicating with the towers you are going to be handed over to.

In hard hand overs, the phone will literally drop the active connection and transition to another connection. The hand over can be further complicated if it is a vertical hand over, which happens between network technologies. That is, from WiFi-C to 4G/LTE, and vice versa.

Virtually all femtocells are hard, vertical hand overs. That’s why a local tower is necessary so that the Cell Booster can build a list of the local towers, hopefully both 4G and LTE, and pass that on to the phone in the form of a neighborhood list. So, when you leave your house and are on a call, a hard hand over (probably vertical) takes place and if your tower is close, the call doesn’t get dropped (in theory). The opposite is true as well. However, if the tower closest to you is far away, handing over is going to be very difficult.

This is one of the most frustrating aspects of the Cell Booster (and femtocells in general). If your local tower is far away, you’ll probably get excellent coverage in-home, but handing over when you leave your house will be problematic. On the other hand, if you have a tower or towers close by, handing off will be great but in-home coverage or handing off to the Cell Booster may suffer due to Cell Booster's

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

transmission strength.

However, with the increased power output of the new Cell Booster over its predecessor, the MicroCell, and the fact that the Cell Booster should be capable of a soft handover (LTE to LTE, 4G to 4G) this may not be an issue anymore. Do keep in mind though that it all depends on which frequencies and bands the FCC authorizes AT&T to use for your service area.

TECHNICAL INFORMATION

The Cell Booster is based around Qualcomm's Dual-mode cellular (Node-B LTE), LTE-U transceiver, and a couple of other SoC's that are proprietary to AT&T/Nokia. Most likely all are ARM-based.

Range is about 3,000 square feet for the CB and 15,000 square feet for the CB Pro. But that is dependent, in part, on how close or how far away you are from a tower (depending on power adjustment). Generally speaking, if a tower is within 2 miles of your home, coverage should be ok.

The Cell Booster operates on AT&T's LTE network:

- Band 2 (1932MHz ~ 1980MHz) - range is due to FCC licensing
- Band 4 (2112MHz ~ 2152MHz) - range is due to FCC licensing

The Cell Booster Pro operates on AT&T's LTE network:

- Band 2 (1930MHz ~ 1990MHz)
- Band 14 (700MHz)
- Band 66 (AWS-3 2110MHz ~ 2200MHz)

LTE on AT&T:

- Band 2 (1900MHz)
- Band 4 (AWS 1700MHz/2100MHz)
- Band 5 (850MHz)
- Band 12/17 (700MHz) - backbone
- Band 14 (700MHz) - public safety channel
- Band 29 (700MHz) - supplementary channel for downloading only
- Band 30 (WCS 2300MHz) - supplementary band
- Band 66 (AWS-3 700MHz/2100MHz)

5G on AT&T:

- Band n5 (850MHz) - Low Band
- Band n260 (39GHz) - mmWave

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

Signal Strength/Quality

On my iPhone 12 (iOS 15.3), you can check your cellular signal information by dialing *3001#12345#* and then Call. This is not a hack so you won't brick your phone. This gives you access to the Metrics Dashboard and will display Band Info, Radio Access, Bandwidth, RSRP, and other info. Swiping up will close the Dashboard.

RSRP is the mathematical equivalent of signal strength for LTE. The closer to 0, the better the signal. RSRP is a much more accurate interpretation of signal strength than RSSI, or the signal bars we are used to, and is measured in dBm (0 to -110 dBm). **NOTE:** RSRP 0 is the tower you are connected to. RSRP 1 is the backup tower.

-90dBm = Excellent
-91dBm to -105dBm = Good
-106dBm to -120dBm = Fair
-121dBm to -124dBm = Poor
-125dBm = No Signal

RSRQ is the indicator for signal quality for LTE and is measured in dB (0 to -20 dB). 0 dB indicates no interference.

Signal Testing at time of Cell Booster setup and activation:

iPhone 7 (iOS 15.2.1)
Carrier Settings 49.0.2
Band 12
Bandwidth 5MHz
Radio LTE
RSRP -104

iPhone 12 (iOS 15.3)
Carrier Settings 49.0.1
Band 12
Bandwidth 10MHz
Radio LTE
LTE RSRP -98

NOTE: The Bands detected by the FTM (Field Test Mode) are different than what AT&T lists for the Cell Booster in my non-scientific test above. That may be depend on which Bandwidth and frequency is being used. The various Bandwidths (5MHz, 10MHz, and 20MHz) were not listed above due to document length and information overload.

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

Results will differ from phone to phone, Cell Booster location/setup, and service area to service area. **NOTE:** download/upload frequencies are not listed.

NOTE: There are 656+ FCC device authorizations with frequency operating ranges overlapping with the specified frequency ranges.

HD Voice, which is what AT&T calls VoLTE on their network, is basically wideband which is 80Hz – 7KHz at about 16,000 audio sample per second. Current mobile phone technology uses a frequency range of about 300Hz – 3.4KHz at 8,000 audio samples per second.

AC Adapter

Model no. is F24L9-120200SPAU with a barrel connector. The power requirements for the Cell Booster are fairly specific and an adapter that is starting to go out can cause all kinds of seemingly unrelated problems, mostly lost connection to the AT&T servers.

Input: 100-240V~50/60Hz, 0.6A

Output: 12.0V, 2.0A, 24W positive polarity



Switching Mode Power Mode

I.T.E. Audio/VideoPower Supply

Measured output at time of setup, 20 VDC

Testing the ac adapter: test the output of the adapter using a voltmeter. Touch the leads of the voltmeter to the outside of the plug barrel and the other tip to the center of the plug. The reading should about 20 VDC with no load. The adapter should be plugged into the wall outlet but not the Cell Booster. The output voltage measured should be higher than the rated output of 12 VDC because there is no load on the adapter while measuring output. If the output voltage varies from 20 VDC by more than +/- 1.0 VDC, then the adapter could be starting to fail. Replace the adapter with one of the same rating as the original adapter (courtesy of Avedis53).

IMSI (International Mobile Subscriber Identity) Number

Your phone will send an IMSI number to the current network while registering which allows the network hardware to recognize the subscriber (phone). This number is sent as rarely as possible to prevent interception and is sometimes sent as a TMSI, which is a temporarily generated code for the mobile subscriber identity. The number is on the SIM card (for phones that use them) and is used by any mobile network that can interconnect with other networks. CDMA networks (Verizon for

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

example) have their IMSI codes embedded. AT&T only supports 310410 (310 = USA and 410 = AT&T). The number is stored as a 64-bit field and is converted to a 15-digit number based on MCC (Mobile Country Code), MNC (Mobile Network Code), and MSIN (Mobile Station Identity Number). So, the MCC is 310 and the MNC is 410, etc. for AT&T.

The IMSI number is converted by AT&T's IT Department to a phone number. But AT&T doesn't have a list of all of the possible IMSI numbers worldwide because that would be very expensive to maintain. The Cell Booster is an IMSI based system which is how it ties into the AT&T network and forces conversion to actual numbers.

What that all means is that if you buy a non-AT&T branded phone, a jail broke phone, or one that is not currently being sold domestically, it may not work with the Cell Booster because the IMSI number is not recognized.

IMEI (International Mobile Equipment Identity) Number

This is not to be confused with the IMSI number. It is a 15-digit number that is unique for each device. The IMEI number is provided by the carrier when you sign up for service. It is the phone's registration number and is also used for tracking phones or blocking stolen phones. The question has come up before, "if I have an AT&T provided IMEI number, why doesn't my phone connect to the Cell Booster?" The answer may be the IMSI number.

CONNECTION ISSUES

This can be a very difficult and frustrating area because a single issue may be caused by different factors so there is not always an exact cause and effect when attempting to resolve a problem. Common "fixes" may resolve different issues. Hopefully the above technical and operational explanations will shed some light on why there are issues for some people and how difficult it can be to identify and correct them.

First of all, the Cell Booster is a totally closed system, physically and firmware-wise. There is no way to access the firmware to modify the system to error check like there is for a router. Physically, the Cell Booster has anti-tamper mechanism on the inside and once you open the unit, the Cell Booster will be rendered useless. That being said, there is absolutely nothing inside that is going to be of any use to the user and/or support.

All of the suggested troubleshooting techniques are assuming that the Cell Booster is setup properly and did work at one time. The suggestions work for most, but not all of the time. Because of the wide variety in home setups, equipment, tower locations, etc. some issues may be more difficult to resolve than others. The use of powered or managed switches can cause issues if they go into standby when no

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

traffic is detected, or some sort of load balancing or priority is initiated, resulting in loss of connection and a restart necessary.

Cell Booster Service Area Outages

The causes for this are many and varied and are beyond the scope of this document so I won't go into that here. An outage can be localized or regional depending on the cause and can be fixed quickly or go on for a week or more. More serious outages can have a cascading affect and reach across different Cell Booster Service Areas over a period of time. Support is usually the last to know about the outages so when you experience a sudden loss of connectivity for no apparent reason, and can't correct it with any of the troubleshooting procedures found here, it's best to initiate a Support session with your issue, what you have done to correct it, any previous trouble ticket numbers assigned to you, your account information, the best way for AT&T to contact you, and most importantly, your location. Individual connectivity loss can happen at any time, but if Support starts to see a pattern with the same issues reported from different locations, the Network Engineers should be notified and with the location info, it may help them to isolate and correct the problem quicker. The outage may also affect other services such as the Cell Booster account page so that attempting to deactivate/reactivate your account, or modify your account in any way may not work.

Once the outage is isolated and corrected, not all Cell Booster Service Areas will come back online at the same time because it will take time for the fix to propagate thru the system, and there may still be localized areas that will take a little more work to identify and correct. You may have to perform a **Complete Reset/Activation** for your Cell Booster if simple power cycling or any of the other procedures listed do not work.

All LED lights should be a solid WHITE to indicate the Cell Booster is operating optimally.

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

Device Condition	Power	Internet	Status	GPS	4G LTE
No Power	Off	Off	Off	Off	Off
Power Applied - Ready	Solid White	Any	Any	Any	Any
Self-Test	Solid Orange	Solid Orange	Solid Orange	Solid Orange	Solid Orange
Hardware Fault detected	Solid Orange	Solid Orange	Solid Orange	Solid Orange	Solid Orange
Software Download Failure	Flashing White	Flashing White	Flashing Orange	Off	Off
Tamper Detected	Solid Orange	Solid Orange	Solid Orange	Flashing Orange	Flashing Orange
Initializing	Flashing White	Off	Off	Any	Any
Environment Failure	Flashing Orange	Flashing Orange	Flashing Orange	Flashing Orange	Flashing Orange
Network Access Failure	Flashing or Solid White	Solid Orange	Off	Any	Off
Network Connectivity Failure	Flashing or Solid White	Flashing Orange	Off	Any	Off
Network Authentication Failure	Flashing or Solid White	Solid White	Flashing or Solid Orange	Any	Off
Network Connection Failure	Solid White	Solid White	Flashing or Solid White	Any	Off
Timing Failure	Solid White	Flashing White	Flashing Orange	Any	Flashing Orange
GPS In Progress	Any	Any	Any	Flashing White	Any
No GPS Signal	Any	Any	Any	Solid Orange	Any
GPS Lock Successful	Any	Any	Any	Solid White	Any
Radio is Locked	Any	Any	Any	Any	Off
4G LTE Radio Ready	Any	Any	Any	Any	Solid White
4G LTE Radio In Use	Any	Any	Any	Any	Flashing White
4G LTE Radio at Capacity	Any	Any	Flashing White	Any	Flashing White

The Table is a little confusing to read but basically all of the LED lights should be a solid White and not flashing if operating optimally. If not, the color-coded areas will be an indicator of what the error is. As I get more confirmed information, I'll add some detailed explanations to what some of the Device Conditions mean and fixes. Some of the recommendations may seem obvious but maybe not to all (courtesy of Bill46789).

POWER LIGHT

Check to make sure that the cable is firmly in place in the Cell Booster and that the adapter is snug in the wall outlet and not hanging loose.

As with the old MicroCell, the ac adapters were not the best in the world so it doesn't hurt to check it with a voltmeter to make sure it's delivering 20 VDC with no load. An adapter that is starting to fail can cause all kinds of issues that are seemingly unrelated so that's usually the first thing to check and rule out.

The power light only indicates that current is detected. It doesn't always guarantee that adequate power is being delivered to all of the components. It should, but it's an easy thing to check.

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

INTERNET LIGHT

Check to see if your router can see the MAC address of the Cell Booster. Check connections and cable condition. Try a different ethernet port on the router. You can also connect a different device to the ethernet port to make sure it's working correctly and your router sees the connected device.

Check to see that the required ports are open all the way from your router to AT&T. Sometimes Support can check on their end to see if they can ping the Cell Booster. It's not sufficient enough to ensure that the ports are open on your router. The pathway has to be clear to AT&T and if there is an upstream switch failing, or your ISP had to make routing changes, that can be the issue. If you don't have AT&T as your ISP then it will be up to you to work with your ISP on port issues. AT&T can't interfere with another Provider's connectivity.

Port forwarding may be an option if too many devices are using the same port or there is an issue with your router's DHCP assignment. When I've setup port forwarding in the past for the MicroCell, I used the IP address that was assigned by my router to the MicroCell and made it static, and then added the MicroCell's MAC address to the table. That way whenever the router detected the MAC address (power failure, maintenance, whatever), it always used the same IP address for the required ports. As far as setting up port forwarding, that too is something you'll need to work out with your ISP and/or the mfr of the router. Given the many different routers, models, and firmware versions, it's impossible for AT&T Support to keep up with them let alone offer support to a customer on how to configure their network for the Cell Booster for equipment that is not their own. Besides, AT&T doesn't want to be responsible for messing around a customer's network. Port forwarding shouldn't be necessary but sometimes it's the only way to make stable and reliable connection given your ISP. And if you have issues, calling your ISP for help may be frustrating because quite often they will say it's AT&T'S problem because it's their service, not your ISP's. Some ISPs are a lot worse than others when it comes to that. **However, Port Forwarding or Port Triggering should not be necessary.**

If you use switches or any kind of load balancing that may work but keep in mind that the Cell Booster must maintain an uninterrupted 24x7 connection to the AT&T Mobility Servers. That also holds true for firewalls.

At times, a simple Reset of your system (Cell Booster and router) may correct an issue with connectivity.

Make sure your router is on its current firmware version or if there has been an update, either automatic or manual, double check the Cell Booster's router

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

requirements. Updates have been known to cause issues.

STATUS LIGHT

Self-explanatory, at least for now. I will add more if there are questions.

GPS LIGHT

The Cell Booster must maintain GPS lock at all times. The reasons for this are given in the Initial Activation section. It's not uncommon for the GPS light to flash while it is attempting a location check. Once the LED turns a solid white, that means the location check has completed. That doesn't necessarily mean that your location has been verified. If that's the case you should receive a text indicating that your location could not be verified even though the GPS light is a solid white. Location verification is dependent on your GPS coordinates being sent to AT&T and in turn matching them to the physical address that AT&T has on file. GPS/address information is sent to AT&T on a periodic basis from various agencies and is an FCC E911 requirement. If you live in a new development, a rural area (country road, route number, etc), or an apartment building the information may not match. Even if the Post Office, Amazon, or whomever can reach you, that doesn't mean that the Locational Database has been updated by the service(s) that provides that information to AT&T.

This is also important if you move the Cell Booster to another location (summer home for example). In that case just change the physical address of where the Cell Booster is currently located and you should be fine.

GPS location is also part of the periodic maintenance /updates of the Cell Booster which is usually done late at night or very early in the morning to minimize service interruption. These are not announced but do require the Cell Booster to reboot, which in turns starts the Activation process again. So, if you may see the Cell Booster flashing lights early in the morning it could just be rebooting after maintenance or update.

NOTES ON ANTENNA: AT&T uses the GPS information from GEOLink to establish your location. Those coordinates are updated into what's called the MTI Tool as a physical address and then matched to the database. This is necessary to activate the Cell Booster to the local tower.

Once you have established GPS and the Cell Booster is fully activated, you need to keep the antenna connected but it doesn't necessarily have to be attached to a window. In most cases, depending on your area, you can remove the antenna from the window and just place it behind the Cell Booster to keep it out of the way. I have

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

my antenna just to the right of the Cell Booster but not in direct sight of the window. I moved my Cell Booster, after it had been activated and running for a day to the other side of the room. I never bothered to put the antenna in the window next to it and was up and running again in less than 10 minutes with the antenna behind the Cell Booster.

4G/LTE LIGHT

This too should be self-explanatory but more detail will be added if needed.

Keep in mind that the Cell Booster does not need the local tower for calls. That is all handled thru your internet connection. However, if the local tower is down due to maintenance or environmental factors, that may affect the GPS location which in turn could cause issues. There could also be other factors that we will just have to address as they come up and offer solutions.

De-registering/re-registering your Cell Booster may be a solution to establishing connectivity but this really should only be done with the understanding of what happens when you do that. When a request is sent to AT&T, it may take a couple of hours to over a day before the request goes thru the system and is acted upon. If you keep sending the request the system won't have time to process the request correctly (too many attempts for example) and that may cause your Cell Booster account to lock up. With the MicroCell, I've seen a request processed within an hour and at other times an entire day. Hopefully the system is more robust now but do keep that in mind.

The 4G/LTE will remain a solid white when in standby. A flashing white light indicates the Cell Booster is either in use or the maximum number of active users has been achieved. However, the light pattern appears to be inconsistent at this point in time. Any calls made thru the Cell Booster will count against the account number of the phone being used, not yours. **NOTE: connecting to the Cell Booster is not instantaneous. It may take up to a minute or so if changing from a tower or WiFi-C. You will see LTE displayed if WiFi is disabled. Otherwise, it is "covered up" by the WiFi signal bars, at least on my iPhone 12.**

Phone Not Connecting to the Cell Booster

The causes for this can vary but if the Cell Booster looks operational (Power, Internet, GPS, and 4G/LTE lights are solid white), then it's probably the phone.

For the iPhone, make sure your phone is set to LTE (Settings -> Cellular -> Cellular Data Options -> Voice & Data), or Reset Network Settings and see if that works, or whatever the equivalents are for other phones. Keep in mind that Reset Network

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

Settings may result in a loss of passwords, and other settings so make sure you have the information written down someplace so you can quickly re-enter it. Call Support because they can sometimes tweak account settings on their end that improves connectivity.

Non-connectivity could be an IMSI issue (see IMSI Number). If that's the case, there is very little that can be done by AT&T.

See transmission strength under Initial Activation.

Turning Airplane mode off and then on sometimes re-establishes connectivity but this is only a temporary "fix".

Dropped Calls and/or Call Quality

The main cause seems to be variable internet speed. The faster, and more stable your speeds are, the better the call, connectivity and quality-wise.

Latency, packet loss, etc. will affect your calls. RTP jitter can also be a problem with VoIP calls using the Cell Booster. RTP (Real Time Protocol) is defined as the variation in the delay of received packets and can be caused by network congestion, improper queuing, or configuration issues.

Another cause may be that the tower signal is stronger than the Cell Booster signal (see Handing Over and Initial Activation above). Disabling call handout on your Cell Booster Settings page may help if that option is still available. Keep in mind that a stucco house can act as a Faraday cage and interfere with your calls. Terrain, weather, buildings, building construction, foliage, and **tower aim** can all play a role in increasing or decreasing tower signal strength.

Leave WiFi on your phone turned on. That way, data is handled by your router's WiFi and voice is left to the Cell Booster. The recommendation is to always leave WiFi enabled on your phone (not to be confused with WiFi-C).

Vonage

If you have the Vonage VoIP service you may encounter Cell Booster problems with the use of the Vonage VDV22/VDV23 Adapter.

Vonage uses the SIP ALG protocols (Session Initiating Protocol Application Layer Gateway) which is used to try and avoid configuring static NAT on a router. Many routers today come with this feature enabled by default. While ALG could help in solving NAT related problems, the fact is that many router's ALG implementations

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

are wrong and break SIP.

SIP ALG will not cause problems with the Cell Booster as the Cell Booster does not use SIP protocols. However, in many cases, the SIP ALG is implemented poorly and can cause other issues. If you can make your Cell Booster work with SIP ALG turned off, then it's an indication that SIP ALG is implemented poorly causing Cell Booster traffic disruption even though, in theory it should not. AT&T Support cannot help you if that is the cause of your issues.

MISCELLANEOUS

Sometimes the Cell Booster just doesn't work because of the multitude of variables. It is also possible that the Cell Booster is a lemon and needs to be replaced. If that's the case, then you will have to contact Support and go thru a series of troubleshooting steps before they can determine that it needs to be replaced. All of those steps have been detailed above so you'll be repeating what you've already done, but Support has to document that THEY went thru those steps with you. Be polite, and patient with Support. They are limited in what they can do and I think their support is limited at times as well. Be as clear and concise as possible in describing your problem, what you have done to fix it, and explain your setup as clearly as you can. You can contact Support directly or post a question in the AT&T Cell Booster Forum with your issue and hopefully get some help there from one of the senior members (ACEs) or ATTHelp.

For a brief period of time, the Cell Booster was given away for free to some existing MicroCell users who still had active accounts so that they wouldn't lose service once the 3G/4G service was discontinued. That program is limited to the initial rollout of the Cell Booster. Whether AT&T will continue to do that on a case-by-case basis is unknown. That will be totally up to the support person you talk to, and their supervisor, so be nice. Some Corporate Store (not an Authorized Retail Store) managers may be able to do that as well once they are in stock but it is certainly not company policy and will be totally up to them. However, there may still be customers who receive free Cell Booster's from time to time so it can't hurt to ask. This will probably only be true if you have a documented history with Support regarding poor in-home cellular coverage. If you receive a replacement Cell Booster that doesn't come with the ac adapter, ethernet cable, or complete documentation then it is probably a refurbished unit.

Purchasing a used Cell Booster

1. Caveat emptor is the operative word.
2. Do not buy any used Cell Booster that the seller will not, or cannot **guarantee** was properly deactivated. AT&T is very reluctant to de-register a

AT&T 4G/LTE Cell Booster™ Informational Document for
Technical, Operational, and Troubleshooting Issues for the Model SS2F11
Version 3.0
by Otto Pylot

Cell Booster because they don't know if it has been stolen or not.

3. Do not buy any Cell Booster that is not in good working condition and doesn't
4. appear damaged or tampered with, the seller should provide you with a small return window (14 days for example).
5. Even if the Cell Booster is sold as "new" or within its warranty period, the warranty is not transferrable.
6. Ask the seller to send you or post a picture (close up) of the back of the Cell Booster showing the serial number. The serial number is how the Cell Booster is registered to your account, so if you enter the serial number on the
7. registration page that should tell you if the number is bad or still registered under another account (courtesy of rjniles).

Cell Booster Alternatives

There are instances when the Cell Booster just won't work in your environment for various reasons. In that case, you may need to use a cellular signal booster if WiFi-C is not an option. See my Cellular Booster Guide for a primer: [Cellular Booster Guide](#). Some of the information may be a little dated but the basics are what's important.

SUMMARY of TROUBLESHOOTING STEPS

Perform a Reset. Hold the Reset button for 5-10 seconds or Reset to Factory by holding the button for 30 seconds. The Cell Booster Pro requires a paperclip to press the Reset button. Resetting your Cell Booster, especially a Factory Reset will cause you to lose your settings so don't forget to check them.

Power cycle the Cell Booster.

Power cycle the router/modem/gateway.

Deactivate/reactivate your account.

Turn your phone off and then back on to re-establish connectivity.

Check cables for condition and snugness of fit.

Check orientation of the Cell Booster.

Make sure the antenna is firmly in place.

Reset network settings on your phone or have support check your network settings.

Make sure your phone is set to LTE.

AT&T 4G/LTE Cell Booster™ Informational Document for
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Enable WiFi for data.

Toggle Airplane mode on and off.

Check stability of your internet speeds and make sure you have sufficient speed.

Check that all of the necessary ports are open all the way to the AT&T servers.

Setup port forwarding or triggering of the required ports to a statically assigned IP address based on the MAC address of the Cell Booster, or place the Cell Booster in the DMZ like you would a gaming device (**NOTE:** if you don't have AT&T service or supplied equipment, you will have to contact the mfr. of the router and/or the ISP. AT&T can't help you with that). Port forwarding shouldn't be necessary but it may make for a more stable connection.

Try different locations in your house to find the “sweet spot”.

Keep the number of devices between the Cell booster and AT&T to an absolute minimum.

Adequate ventilation around the Cell Booster.

Check the ac adapter with a voltmeter. It should read $16\text{VDC} \pm 0.5$ with no load.

Connect the Cell Booster directly to your modem (Alternate Setup) to rule out any router issues if you don't have a gateway (modem/router combination). This may or may not work now because of the new chipsets and firmware changes.

If you are using Powerline Adapters, bypass them if possible and see if that improves your connection.

Make sure you don't have a double NAT.

DISCLAIMER

This has been a very long project and is still a work in progress. I have tried to make this as accurate as possible. As more accurate information, corrections, or fixes become available, I will update the document. You can DM me for any corrections or future additions to this “living” document.

I am not an AT&T employee. However, this document would not have been possible without the considerable help and guidance from the AT&T Forum Admin, AT&T Support, Mobility Broadband and Network Service, and the Cell Booster Forum members.

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Thanks to southerndoc for his help on the Cellular Booster Pro and Bill46789 for his contribution to the LED chart, and I would also like to extend a special thanks to Avedis53 and rjniles for their help and support with the original MicroCell Technical Guide.

Otto Pylot
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ADDITIONS/CHANGES

Version 3.0, Feb. 2022

1. Modified the MicroCell Version 2.1 (July 2017) to reflect the new Cell Booster, and deleted information that was no longer accurate or relevant.
2. The original MicroCell Technical Guide was released as Version 1.2 in August, 2013, with continual updates over 8 years from 1.2 to 2.1.