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## Simulsat-5B Reflector Swap Planning Guide

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With the advent of DVB-S and DVB-S2 signals, some legacy Simulsat-5 antennas are due for an upgrade. ATCi has developed the Simulsat-5B for this purpose. The Simulsat-5B has a new computer-derived reflector shape, improved surface accuracy due to the use of advanced 3D CAD modeling and 5-axis CNC tooling processes, is made using modern vacuum-assisted resin infusion manufacturing technology, and is made with leading edge materials. With these improvements, ATCi has seen new Simulsat-5B reflectors provide 1.5 to 2 dB signal quality gains over legacy Simulsat-5 antennas. Below is an outline of how this new reflector can be swapped out with minimal outage. On ATCi's web site there is a time-lapsed video of a reflector swap.

During the project process ATCi will send to the customer a Service Request Form (SRF), which is a writable PDF form, to gather specific information about the project.

### Pictures

ATCi's Engineering Dept. needs to have pictures of the antenna mount, reflector, feedbox, pivot block, front rails, all associated metal parts, the surrounding area for crane and assembly access, and bucket truck access.

### Satellite List/Feeds

The new Simulsat-5B reflector comes with a new feedbox. This new feedbox is wider than that of the legacy Simulsat-5 antenna. An accounting of all feeds is needed in order to send new mounting hardware for all existing feeds in the feedbox and any spares available. The customer will be asked to provide this accounting on the SRF. This will help to ensure that the reflector swap goes smoothly.

### Cables and Junction Box

If purchased with the new reflector, new RG-6 quad-shielded cables will be sent. These cables are sixty-two feet long and come terminated on one end. The cable routing is different for the new reflector, and the existing cables will be too short. An accounting of all cables is necessary for the reflector swap process. Please mark all cables with some type of system that is understandable for all concerned. This information will help speed up the process. If purchased with the new reflector, a junction box can be added at the base of the antenna. These junction boxes come in two types, fiberglass and stainless steel. Inside is a plate with forty F- type barrel connectors. Adding a new junction box can help cabling issues that have occurred over time and will help with cable management. Please contact your sales rep for more details on this matter.



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## Corner Support Pads

The Simulsat-5B uses vertical corner supports where the legacy Simulsat-5 used wind struts that were angled back to the base of the antenna mount. New concrete corner support pads will need to be installed. For roof mounts, many times the existing load frame can be used for the new corner supports, but this will need to be evaluated.

The steel angle from the old wind struts and some new brackets and an adjuster will be used for the new corner supports. ATCi will provide a drawing showing where to place the corner support pads. Below is a picture of newly installed corner support pads and corner supports.



## Crane

A 15-ton hydraulic crane will be needed to offload the reflector. This same type of crane can also be used to assemble the reflector. When the old reflector is ready to be removed a 25-ton hydraulic crane is needed for this process.

In some cases it will be necessary to have the crane company visit the site to ensure that the crane size is correct. Many times it's not the weight of the item being lifted but the distance from the crane to the antenna mount that will determine the size of crane required. Please consult with your crane provider.

Crane arrangements and costs are the customer's responsibility.

## Other Items

With a Simulsat Reflector Swap, timing is critical. Communication with the ATCi Engineering Dept. is important. ATCi will require (4) local personnel to help assemble the reflector during the day and also assist during the reflector swap, which frequently occurs in the maintenance window. A headend tech should be assigned to changing the feed hardware once the feeds are removed from the feed box. Portable lights should be brought to the site to ensure the night



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works goes smoothly. Having the cables labeled from the headend to the LNB's will only help the process. Please contact ATCI's Engineering Dept. with any questions or concerns.

## Timeline of Events

Below is a timeline of events for a Simulsat antenna reflector swap.

### Day 1:

**8am:** Arrive on site. Crane and crew should arrive at this time too. ATCI will establish the location to build the new reflector and get the crane set where it needs to be. ATCI also does a safety talk, and brief outline of the day's activities.

**8:30am:** Begin assembly of the new Simulsat reflector. This takes anywhere from 4-6 hours.

**2pm:** Inspect the new reflector for correct assembly, and inspect the old reflector to make sure that it will be ready to be removed off the mount without any surprises. We'll take a break until we need to be back for the actual swap after this.

### Day 1 Night Work:

**10pm:** Arrive on site. It is not necessary for the crane to be here at this time, but the whole crew should be on site. We'll have a brief safety talk, and outline the night's activities.

**10:15pm:** Start removing NON-service-affecting assemblies on the old Simulsat. We want this antenna to be as ready as it can be BEFORE the maintenance window opens.

**11:30pm:** Crane should be on site by this time.

**12am:** Remove roll angle from old Simulsat. This is required in order to get the reflector off the mount. All services on the Simulsat will go out when the antenna roll is removed.

**12:30am:** Rig the old Simulsat for removal, and remove the old reflector.

**1am:** Rig the new reflector for the lift onto the mount. During this time ATCI will have one or two workers (depending on the number available) use either a ladder or extra bucket truck to remove the feeds from the old feed box.

**1:15am:** Lift the Simulsat 5B reflector, and mount it to the ring.

**2am:** Start alignment of the new reflector. By this time all the old feeds should be removed, and 3 feeds with new the new rack hardware will be installed to align the reflector.

**3am:** New reflector should be aligned. Before the rest of the feeds are installed we will run the cables from the feedbox down the spar legs. At this time, the routing of the cable to the junction will be done and the conduit and couplers will be installed. Also during this time an adjustable corner support will be installed to allow for optimization of the geometry of the reflector, if needed before all feeds are installed.



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**4am:** Start installing feeds. While the field engineer is doing this helpers will be doing other things like installing the other corner support, and terminating cables in the junction box.

**4 - 8am:** Complete feed installation and feedbox cabling. Do a channel audit to make sure all services have been restored before 8am.

The ATCi field engineer will be on site until all services have been restored. There is a chance that the field engineer will have to come back the next night to finalize the feeds. If the field engineer determines that all feeds are fully optimized, this will not be necessary, but it is best to be prepared for it.

If the maintenance window is needed the following night, the field engineer will return that night during the window, optimize the feeds, and take Proof of Performance measurements. If further feed optimization is not required, the field engineer will be back in the morning to take Proof of Performance measurements. Typically this data is taken on open splitter ports, so this will NOT interrupt service unless there is a splitter that doesn't have any open ports. If that is the case then the field engineer will need to measure that satellite during a maintenance window.

Please keep in mind that there are several factors that can affect this timeline. However, there are things that the customer can do to make this go as fast and smooth as possible. Sufficient lighting makes a huge difference. Having enough able bodied personnel on sight really helps the process along. Also, making sure the crane size meets or exceeds requirements is a big time saver. Moving and/or re-setting the crane can cause big delays. There are a few things we can't control, but having a handle on the things we can really make all the difference during these swaps.

## **Conclusion**

ATCi has successfully completed a number of reflector swaps within the customer's maintenance window. With cooperation from all parties concerned this operation will go without issues. Please contact ATCi's Engineering Dept with any questions or concerns.