PEAK OF FLIGHT NEWSLETTER

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SUGGESTIONS FOR HIGH RATE OF LAUNCHES AT BIG EVENTS

- PART 1 OF 2

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www.ApogeeRockets.com
4960 Northpark Dr, Colorado Springs CO 80918
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PEAK OF FLIGHT

Suggestions for Big Launch Events

By Tim Van Milligan

The big thing that frustrates flyers at a rocket launch is a slow pace of launching the rockets. We don't care about other people's rockets, but we want our own rocket to get off the pad as quickly as possible. Having to wait an hour while your rocket is sitting on the pad, with the on-board camera burning its batteries and filling up the memory card is highly irritating. Tempers start to flare, and shouting begins.

Rocketeers will travel hundreds of miles to attend a big launch, with the back end of their car stuffed with dozens of rockets. But because of the through-put pace of launching, they may be lucky to get three flights off in a day.

How do you run a launch that is both safe and where the pace is quick? That is what I'd like to talk about here.

To figure out how to speed up a launch, you have to start with a list of the things that slow down a launch. And there are many, many things that will slow down the pace of a rocket launch. I'll go through them, and give some suggestions on how to minimize their effect on the pace of the launches.

Misfires

By far the biggest cause of a slow pace of a launch, at least from the perspective of the people standing in the queue line, is misfires on the launch pad. Say for example you've been assigned to pad B5, and the person currently on B5 is experiencing misfire after misfire. You're more frustrated than them, because you're absolutely sure that your igniter is going to work the first time the LCO (launch control officer) pushes the ignition button. And you're watching the line going out to pad B6 moving fast because their rockets are taking off the first time the launch button is pushed. You're asking yourself, "how come I wasn't assigned to B6?"

The solution: Don't assign pad numbers right after the rockets go through the safety check tent. The modelers should be asked to queue up in a line by the size of the pad that they need. So for example, if you have a rocket that needs a ¼-inch launch rod, you should go stand in the line for the ¼-inch pads.

That way, if the bank of ¼-inch pads has 8 positions, and two of them are being held-up from misfires in the last round, then at least 6 people can move forward and fill the open pads. No one person is waiting for a specific pad number to open up.

To make this happen, you're going to need at least one range volunteer person to control the queue lines. Remember, one line for each launch rod/rail size. If it is a huge launch, then you may need several range personnel for this task, so you can have one person control each queue line.

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Newsletter Staff
Writer: Tim Van Milligan
Layout: Derek Villar
Proofreader: Michelle Mason

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Later on, I'll talk about the flow of flight cards, and how the pad number gets written on the card. But the important thing is that the modeler doesn't have to wait for a specific launch pad. They can always feel progress at moving toward the front of the line.

The other way a misfire can slow down a launch is at the LCO table. There needs to be a process in place to control the flight cards in case there is a misfire on the pad. What I've seen happen too many times is that the RSO (Range Safety Officer) and the LCO are in charge of the flight cards after the launch pads have been assigned. So they are trying to organize the cards themselves while at the same time they are launching the rockets.

There needs to be someone specifically in charge of the flight cards at the launch table. Their job is to organize the cards by pad number, so that the RSO can focus on the safety of the launch.

This past weekend, I was watching this very thing happen at a large launch. I observed the RSO and the LCO fumbling around with flight cards, losing them because when a misfire happened, they put them in their own separate stack. And that stack would be disorganized and just cause more and more confusion.

So my daughter and I just casually walked up to the LCO table and volunteered to just organize their flight cards. Initially, there was a lot of resistance by the RSO and LCO, because they wanted to be in control. They flat out told us to go away. It is a big responsibility for them, so I could totally understand their apprehension.

But we just hung around for 10 minutes, just trying to be helpful to them by chasing down the flight cards that blew off the table, or offering to hold the cards that were associated with the rockets that just had a misfire.

I have to say that slyly, while the RSO wasn't looking, we intercepted the flight cards that were coming over from pad assignment, and we organized them. We weren't supposed to do that, but we did it anyway. And when the RSO started shouting, "Where are the flight cards?", we would just hand them over and say - "This is the next batch, and they're already in order by pad number." That would catch them off guard, because their job just got a tiny bit easier. They were still in control of the range, but it was just that all the cards were in order and ready for them to go.

That little tactic really helped to speed up the launch. In my opinion, the RSO and the LCO should be isolated as much as possible. Their responsibilities are so huge (the safety of the entire launch), that they don't need the distraction of controlling the flow of flight cards.

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They should just be handed a stack of flight cards and told - “this is the next batch of rockets ready to go.” And if there is a misfire of any rocket in the bank of pads, just give that flight card back to the person controlling the flight cards.

I have to say that my 16-year old daughter was actually better at controlling the flight cards than I was. But there were times when she had a problem deciphering the handwriting or such. At that point, she would come to me and we’d try to track down the modeler and figure out what their hen-scratching was supposed to be. We’d sort out the difficulty before the card made it over to the RSO. That way the RSO wasn’t slowed down trying to figure it out themself. That task alone really helped out the through-put of the rockets leaving the launch rods.

Another task that I slyly did, when the RSO wasn’t looking, was to intercept all the people coming up to the table to ask the RSO a question. Rocketeers are constantly coming up to the range head to ask the RSO a question. It could be that they want to know if the left side of the range was open so they could retrieve their rocket, or if the RSO knew why that modeler in pad B5 was having so much problem with their igniters. Remember that modeler? He’s still having misfire after misfire.

What I was doing was intercepting all the mundane questions that didn’t involve the safety of the range, and freed up the RSO to focus totally on his important task. And if there was a question that only the RSO could answer, I’d just say to the person asking the question: “It will be just a second, and I’ll get the RSO to answer that for you.” Just slowing down the pace of questions going to the RSO can help them from feeling overwhelmed. If they get too overwhelmed, then they start to get snippy with everyone - and that isn’t an enjoyable experience for the modelers that drove hundreds of miles to attend the launch.

Doing these two things: organizing the flight cards, and intercepting all the questions coming to the RSO, had a huge impact on the flight operations of the launch. When we started, there was a line about a half-hour long, just to get through pad assignment because things on the range were so backed up. After about an hour of working on the periphery and just trying to make the RSO’s job less taxing, we eliminated the waiting line for pad assignment. The only wait was for the range to open up because rockets were flying all over the place.

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Talkative Announcers

This one is hard to fix. But the person using the PA system (whether it be the RSO or the event organizer) is the one controlling the flow of the launches. If they are overly talkative, then rockets aren't flying into the air fast enough. The queue lines are getting longer, and tempers are getting shorter.

What do the event organizers talk about? Lots of things that includes:

- Opening Ceremonies
- Welcome the crowd and thank them for coming out
- Thanking the local companies that have donated money or services to the club to make the event possible
- Thanking the food vendors for showing up
- Thanking the on-site motor suppliers for showing up
- Talking about a special celebrity guest that is on the field
- Announcing raffle ticket prizes
- Talking extensively about the prizes themselves - in order to build value of the item being given out
- Public service announcements - lost children, found rocket, found cell phone, move your cars from the driving lanes, etc
- Range duty shift is coming up.
- Tracking down range volunteers that didn't show up for their shift assignment
- Talking about upcoming launches the club is going to have

What do all these have in common? They don't have anything to do with launching rockets. But they are sucking up airtime on the public address (PA) system which then can't be used for launching rockets.

In a perfect world, there should be two separate public address systems. One of them controlled by the RSO, and the other via a radio frequency that the spectators could listen to on their car radio. Many clubs simulcast the regular public address system, but why not make it separate? That way two people could be talking at the same time, with the main PA system and speakers used for range operations and safety announcements, and the radio channel used for everything else.

Think of a baseball game… you have a PA announcer that tells you who is coming up to bat. But if you take your radio with you to the ballgame, you get to hear the play-

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by-play and all the special color commentary. The two are completely separate, and it keeps the flow of the game going as quick as possible.

Of course, that isn't going to happen because the Event Organizer will deem his own announcements as being too important, and that they have to be blasted out on the regular PA system; even if they do slow down the launches of the rockets. Am I right?

And what slows down the RSO when he has the microphone? The big one is talking long about complex rocket projects that have to be explained to spectators (a two stage, cluster rocket with airstarts and strap-on boosters). Or maybe a modeler has built a special rocket to commemorate a historical event, and they want the RSO to read off a multi-paragraph description of the project or play some background music to really set the atmosphere so spectators can experience the same thrill that they got building the rocket.

Again, this is the kind of stuff that could be broadcast over the radio station, instead of announced on the PA speakers.

Other people only consider their own projects important, so holding up their launch so that someone else could have the spotlight really isn't that relevant to them. And then broadcasting it over the radio will allow those extroverts out there to really shine and make interesting discussions about the launches. I can just see the guys from the podcast "The Rocketry Show" doing play-by-play, with color commentary of the event. How cool would that be? Right?

But how do you politely ask the RSO to "shut up and launch?" I haven't figured that out yet.

The thing that I do is put a stack of flight cards in their hand, and say to them that these are the next rockets that are ready to go. It is just a subtle hint that there are people waiting to get their rockets into the sky while there is still daylight available.

Equipment Malfunctions

At a big launch, there are two major types of systems that are indispensable to the launch. They are the launch controller system, and the PA system. If either of them go down, the launch is shut down.

Breakdowns do happen all the time. Therefore it is important to "plan" for them to happen. You have to just assume that they are going to happen. The launch control system is going to fail because someone tripped over a wire and it was pulled out of its socket. The PA system is going to get rained on and be shorted out.

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What is your back-up plan for that? More importantly, is it already set up by the time the launch is starting. Yes? Most clubs have a back-up system, but it isn't set up because they assume that the primary system is already working fine and will continue to do so for the entire day. Don't expect it to work all day long. It won't.

Do you have spare parts available when things break? Do the LCO and the RSO (who are both from out of town) know who to call when the system breaks down? Usually the organizer is out on lunch break when things start breaking, and then it takes longer to even track them down to get instructions on who to call to fix it.

The rocketeers and other participants, who drove in from other states, don't care that you have a back-up plan. They only want that system to be set up so that range operations can continue even if the primary PA system has a faulty connection and has to be replaced. They don't want to wait for you to roll it out of the shed and then set it up and test it when the primary system breaks down.

Have a back-up plan!

Poor Penmanship on Flight Cards

It is the little things that add up to slow down a launch. Penmanship on the flight cards is one of those things. "Is that a 9 or a 4?" Or "is that a 3 or an 8?"

I don't know how to solve this issue. But I've seen people that have pre-filled out flight cards on their computer at home before coming to a launch. Those cards are a huge blessing, and I think those people should get an extra ticket to the raffle drawing. Seriously! They are really helping to speed up the launch by making it easier on the people trying to read the flight cards.

So if you're in charge of a launch, why not publish your flight cards as an editable PDF document prior to the launch day so people can pre-fill them out when they don't feel hurried. And if they are typed out, offer them an extra raffle ticket as an incentive, or move them to the head of the queue line as a bonus.

Poorly designed flight cards

Over the years, I've seen flight cards get more and more complex. They used to easily fit on a ¼-sheet of paper. Now, in order for them to still fit on the ¼-sheet of paper, the text has been reduced to 6-point size, and the

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spaces for the modeler to write on them is also just as tiny. This exacerbates the penmanship problem because there is no room for them to write the important stuff.

If you want a speedy launch operation, what information absolutely has to be on the flight card for the RSO to know about? Reduce the flight cards down to that critical information.

- Pad Number
- The modeler's name
- The rocket name
- Primary color of the rocket - so they can identify the model when it is on the rocket pad
- The motor(s) used
- Recovery Device Type (other than parachute or streamer)
- Is it dual-deployment (or chute release)? What is the altitude of the main parachute?
- Multi-stage or Strap-on Boosters? (Do pieces separate as part of a normal flight?)
- Air-starting?
- Predicted Altitude (only if it is close to the waiver altitude or above the cloud base)
- Heads up flight? Why?

The one item that I've seen most often not included is the altitude that the chute release or dual-deployment is set

at. This is a critical piece of information. It causes the RSO to call an alert and get everyone's attention too often, when it is not required. The problem with this is that if the RSO is calling an alert on every flight, then spectators eventually tune it out. The call to "watch-out" should be rare, so that when it does happen people take notice.

While it may be important, there is other information that doesn't need to be on the flight card that is given to the RSO. Maybe consider having a tear-off flight card, where one portion is used by the Safety Check officer to go over during check-in and the other goes to the RSO for launching the rocket.

This may mean that the modeler has to fill out two sections of the document with some overlapping information. But for the speed of the launch operations, I think it would be worth it for everyone.

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This information that doesn't need to be on the flight card for the RSO:

- Name of the organization the modeler belongs to
- Cell phone number
- NAR or Tripoli number
- Modeler's age
- Has the rocket been flown before?
- Type of model: kit, scratch, scale
- Weight of the Rocket
- Launch rod/rail size
- Motor Manufacturer
- CP location
- Certification Flight? What Level?
- What makes this rocket special?

The RSO assumes that the safety-check officers have done their jobs to ensure that only safe rockets actually make it out to the launch pad. "Safety" is a team event in this case. The RSO doesn't need all the information that the safety check people need to make that determination. They shouldn't have to sort through a confusing flight card to find the information they need to announce and launch the rocket.

This also helps speed things along, because the less "special information" is on the flight card for them to read, the shorter the time between launches.

End of Part 1

Next time, we'll continue this discussion on how to make your launch range more efficient so that you can get more flights into the sky at a faster rate. We'll continue with the other situations that will slow down your range, and what to do about them.

About Tim's Philosophy on Customer Service

As I was writing this article, it reminded me of how Apogee Components operates. Our customers are what drives our business, and it is important to keep them happy. Like on the launch range, they want a consistent experience that makes sense and where they know what is happening. And just as important, they want a speedy service. Our guarantee is "same day shipping." You can learn more about his on my YouTube video: Customer Service that Gets Raving Fans (https://youtu.be/BgN50m6g9jY)

What guarantee could you give to your customers on the launch range? Can you promote your next big launch with a guarantee that a rocket will leave the ground at least every 30 seconds?

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