CONTESTANT BRIEFING 2010

Welcome

Team America Rocketry Challenge 2010

Co-Sponsored by:

Aerospace Industries Association

Audrey Koehler, TARC Manager/Contest Director

National Association of Rocketry

Trip Barber, President & TARC Flight Director

Why We're Doing It

- Much of the U.S. aerospace workforce is nearing retirement.
- AIA estimates that while the United States graduates approximately 70,000 engineers each year, only 44,000 are eligible for aerospace careers when you eliminate disciplines not related to our industry and those ineligible for security clearances. The U.S. aerospace industry competes with other industries for a small pool of talent.
- We have already seen a number of students who took part in TARC graduating from college and entering the aerospace workforce.
- **Model rocketry is a fun way to inspire students to study math and science and pursue careers in aerospace!**

Event Background

- Seventh year of a national model rocket contest for student teams: largest model rocket contest in the world
  - 669 teams, 7000 students, from 45 states/DC
  - 335 teams submitted qualification flights
  - 100 teams selected to come to the fly-off, representing 30 states and the US Virgin Islands

Supporters

- Great Meadow Outdoors Foundation – Our host
- AIA and its member companies – The prizes and the staff that handled all the PR and team entries
- NAR – Team mentors nationwide and the 105 volunteer rocketeers running the flying range
- NASA – Student Launch Initiative prizes
- Department of Defense –Teacher prizes
- American Association of Physics Teachers
- 32 AIA Member Aerospace Companies

And many educational organizations nationwide

Activities

- USAF flyover at 1:55 PM (F-22, F-16, P-51)
- Rocket flight demonstrations
  - Opening ceremony
  - 13 high-power rockets: 3 at 2:00, 10 at 4:00
- Team Presentation competition starting at 12:30
- Team Rocket-Building competition starting at 11:30
- Free lunch and ice cream social for participants
- Free bottled water
- Free BBQ dinner for participants ($20 for others)
  - Your credentials are your meal ticket

Exhibits

- Exhibits by universities, DoD, NASA and other organizations
- A list is included in your registration packet
- Some of the displays include:
  - Sprockit the Robot
  - Lockheed Martin F-16 simulator
  - Boeing F-15 simulator
  - Aerospace Jeopardy

Prizes

- $60,000 in cash to top 10 teams
- Winning team gets trip to Farnborough Air Show in July courtesy of Raytheon
- NASA SLI (teacher workshop for top 20 teams)
- DoD teacher prizes (teacher workshops with DoD scientists – see the NDEP exhibit to sign up)
- Special Award Plaques: Best Rocket Craftsmanship, Best-Dressed Team, Spirit of TARC, Best Mission Design
- Presentation and rocket-building competitions

Award Ceremony

- Starts at 5 PM, lasts about 1 hour
- Significant VIP and media participation
  - NASA Administrator Bolden
  - FAA Administrator Babbitt
  - Secretary of the Air Force Donley
  - Aerospace Executives
- NAR staff will control access/seating inside fenced area (students only, top 10 teams have assigned seats)

Press

- There will be at least 4 camera crews filming at TARC
  - You will most likely be on film or in photographs from the day
  - Most of you filled out permission forms in case TARC is featured on the Food Network program
  - If you do not wish to be filmed, please come talk to me after the briefing – we will work on identifying you so that you are not in any shots. Please be aware of the cameras and do not walk up to them or enter any areas where they have already established filming
- Live tweet with us #TARC10

EVENT OPERATIONS

Presentation Competition

- Optional event, $500 prize for 1st place
- 12 teams each do 6-minute presentation plus 2 minute Q&A on their TARC project to judging panel
  - Starts 12:30 PM, order of presentations already published
  - Order will be adjusted to let any teams that make flyoff go first
- Electronic presentations (if used) must be turned in tonight by 9:30 PM for loading on our computer
- If you are one of the 12 but are not ready or want to withdraw, tell us tonight by 9:30 PM
- All are welcome to attend and watch – except teams that are presenting cannot watch others until after they present their own

Team Presenters

Team #	Team Name	City	State	Order
8186	Explorer Post 1010 (Team 1)	Gaithersburg	MD	1st
8169	Bob Jones High School	Madison	AL	2nd
8025	Rockwall-Heath High School	Heath	TX	3rd
8011	Newark Area Home School	Newark	OH	4th
8391	Heuvelton Central School	Heuvelton	NY	5th
8296	Explorer Post 1010 (Team 4)	Gaithersburg	MD	6th
8292	Milton Hershey School	Hershey	PA	7th
8047	St. Anne	Porterville	CA	8th
8202	Templeton High School	Templeton	CA	9th
8348	Boy Scout Troop 17	Charlottesville	VA	10th
8424	Boy Scout Troop 143	Giddings	TX	11th
8502	Hoover High School	North Canton	OH	12th

Rocket-Building Competition

- Optional new event, $100 prize plus two rocket books for 1st place
- 12 teams each have 90 minutes to build a flyable rocket from the bag of parts and the tools & glue provided – done at the Semroc Booth on field
  - 3 teams at a time in 4 “windows” starting at 11:30
  - Sign up tonight after this meeting, standbys taken for teams that end up making the flyoffs
- Judged by NAR for originality of design, quality of workmanship, and flight worthiness

NAR Event Operations Staff

- Flight Director: Trip Barber
- Registration: Eric Robinson
- Range Operations: Jonathan Rains
- Range Equipment: Greg Bock & Mitch Guess
- Results: Chris Kidwell
- Awards Ceremony: John Hochheimer
- Range Safety Officers: Jim Barrowman & John Langford
- Chief Timer: Steve Foster
- Public Address Announcer: Alan Williams
- And 95 others -- all volunteers

Topics

- Safety
- Schedule
- Flight Procedures
- Event Rules

Safety First

- Follow the NAR Safety Code and the Range Safety Officer (RSO) directions
- Listen to the PA and FM radio 92.9 MHz, **stay off FRS channel 7** (NAR/AIA operations)
- No one within 30 feet of a liftoff
- No one on the flying field unless flying
- Do not tilt launch rods toward spectators
- Do NOT try to recover rockets from power lines, or from trees above where poles reach

NAR Safety Code

- Key to the hobby's safety – always in effect
- Lightweight non-metal nose, body & fins
- Certified, unmodified commercially-made motors
- Everyone 30 feet or more away at launch
- Launch electrically within 30 degrees of vertical
- No launches into clouds or with winds >20 mph
- Wait 60 seconds to approach pad after a misfire
- All rockets must have a recovery system

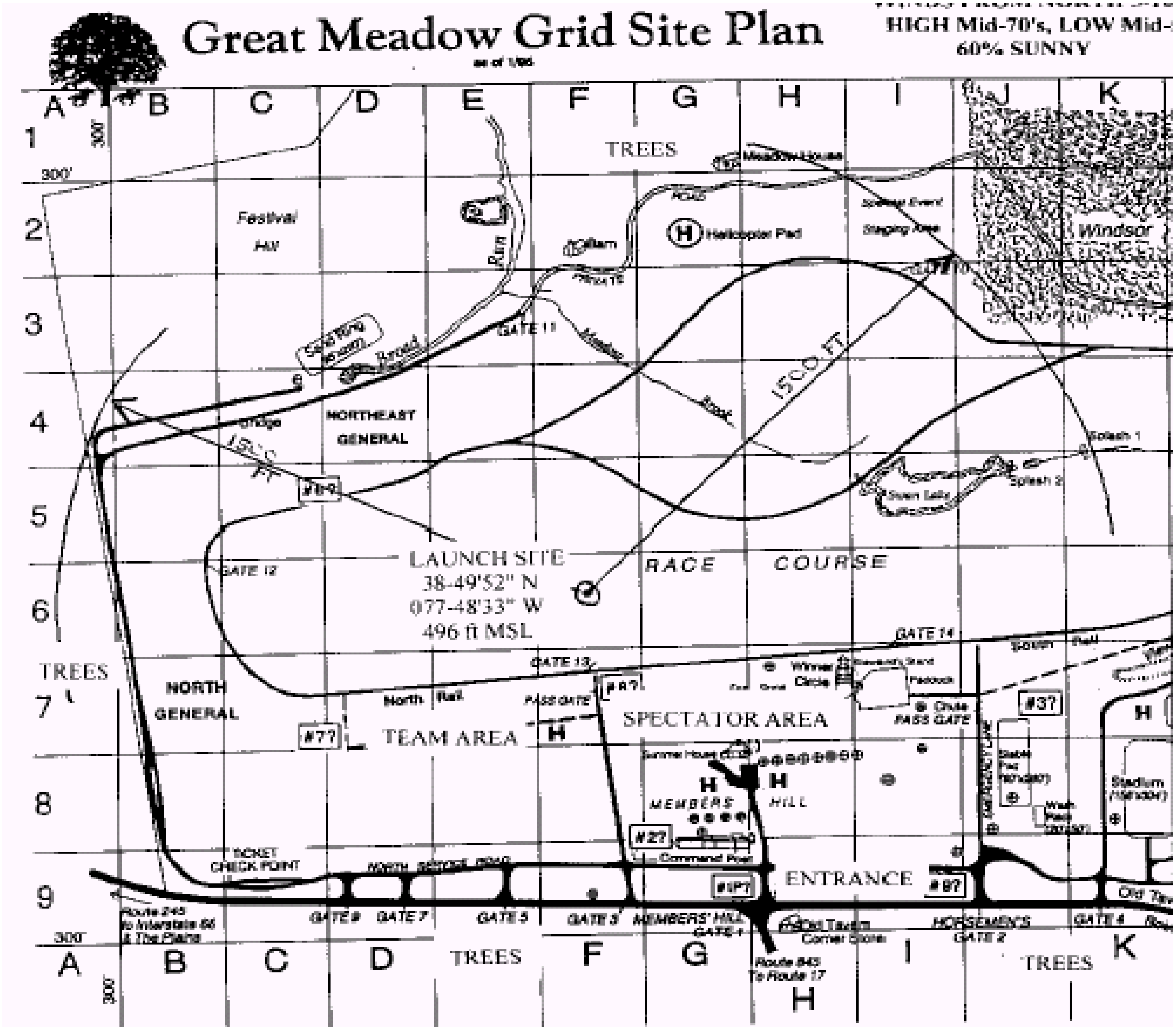
Event Schedule

6:15	Range crew on the field
6:30	Contestants on field, eggs available
6:30	Check-in opens for rockets (first window)
8:30 – 1:30	Contest flying (5 one-hour “windows”)
11:30 – 4:00	Rocket-building competition
12:30 – 1:30	Available for allowed initial-round reflights
12:30 – 3:30	Presentation competition
1:55	USAF Flyover then high-power demonstration
2:00	Notification of 20 teams selected for flyoff
3:00 – 4:00	Flyoff round 2nd flights for 20 teams
4:00 – 4:30	High-power & TARC rocket flight demonstration
4:30	Deadline for rocket returns from 2nd round
5:00	Award ceremony
6:00	BBQ dinner

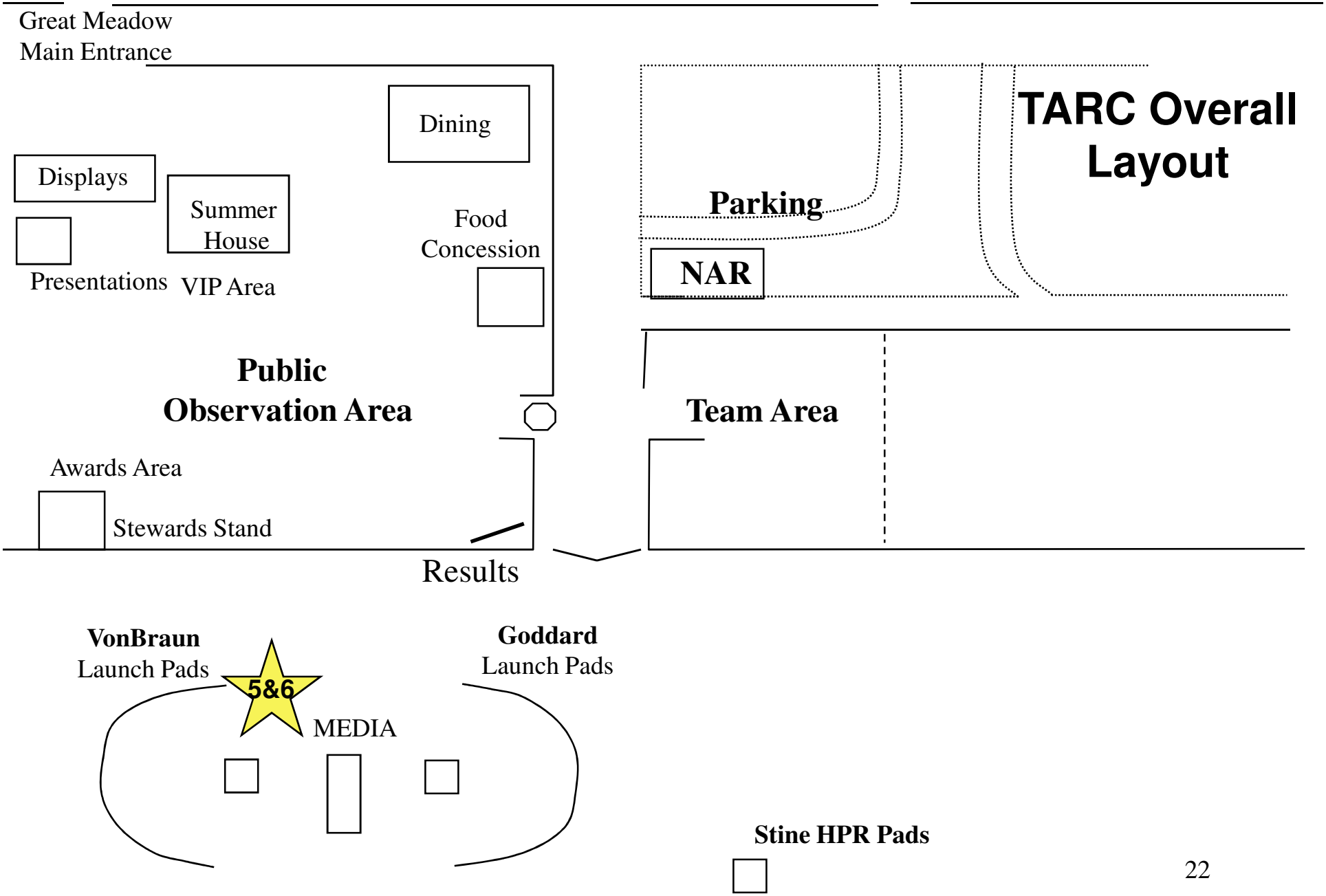
Flight Windows

- Check rocket in up to 2 hours before "flight window"
- May not load rocket on pad until 1 hour before
- Must fly during assigned one-hour "window"

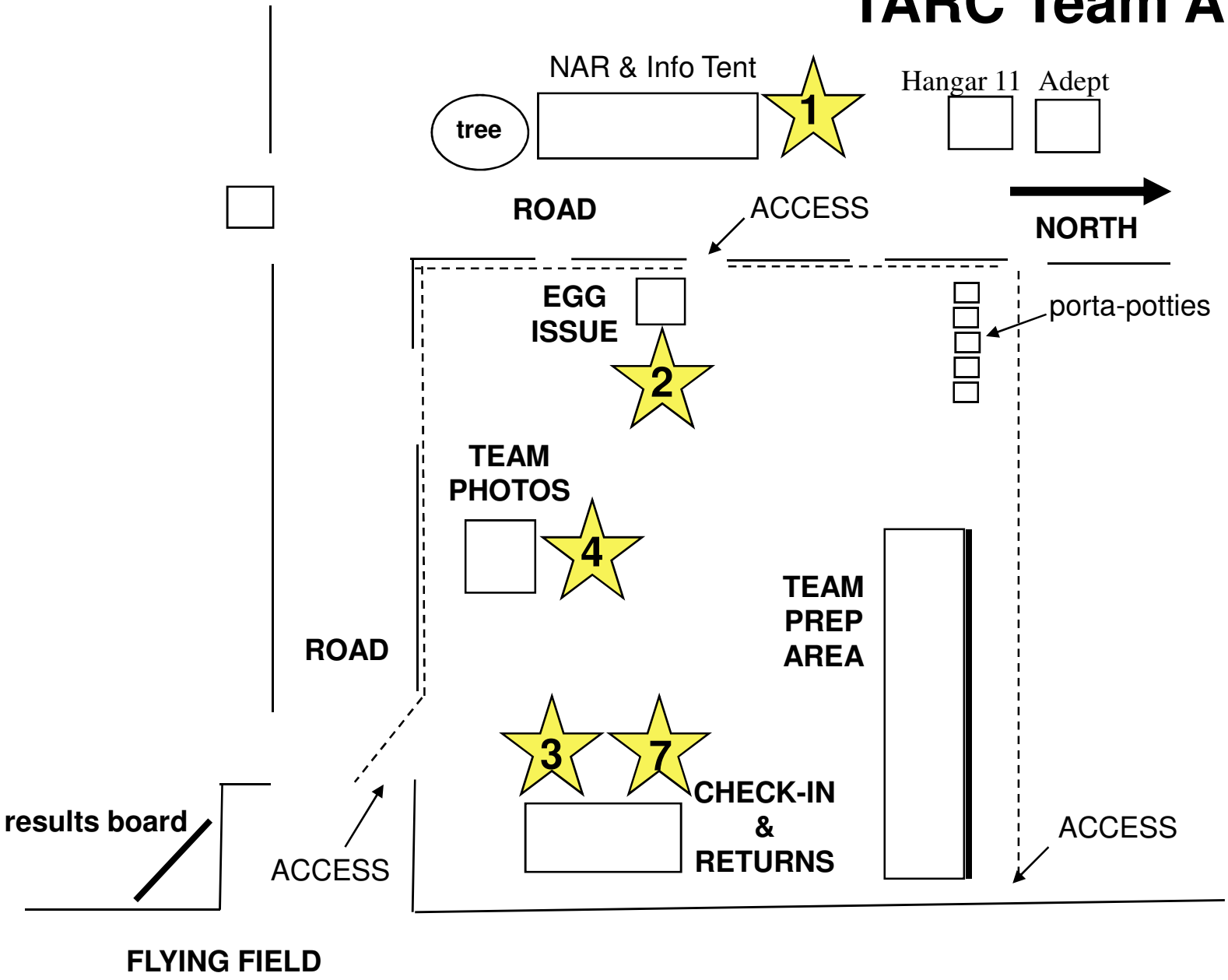
Round	Load Time	Flight Window
Goddard 1	**7:30 AM – 8:30 AM**	**8:30 AM – 9:30 AM**
VonBraun 2	**8:30 AM – 9:30 AM**	**9:30 AM – 10:30 AM**
Goddard 3	**9:30 AM – 10:30 AM**	**10:30 AM – 11:30 AM**
VonBraun 4	**10:30 AM – 11:30 AM**	**11:30 AM – 12:30 PM**
Goddard 5	**11:30 AM – 12:30 PM**	**12:30 PM – 1:30 PM**
Flyoff Goddard 6	**2:00 PM – 4:00 PM**	**3:00 PM – 4:00 PM**


Great Meadow Grid Site Plan
HIGH Mid-70's, LOW Mid-
60% SUNNY
A B C D E F G H I J K
1 2 3 4 5 6 7 8 9
300'
TREES
Festival Hill
Run
Helicopter Pad
Special Event Staging Area
Windsor
GATE 11
1500 FT
NORTHEAST GENERAL
Splash 1
Splash 2
LAUNCH SITE
38-49'52" N
077-48'33" W
496 ft MSL
RACE COURSE
GATE 12
GATE 13
GATE 14
NORTH GENERAL
North Rail
TEAM AREA
SPECTATOR AREA
MEMBERS HILL
Stadium
Command Post
TICKET CHECK POINT
ENTRANCE
NORTH SERVICE ROAD
GATE 9
GATE 7
GATE 5
GATE 3
MEMBERS' HILL GATE 1
HORSEMEN'S GATE 2
GATE 4
Route 245 to Interstate 66 & The Plains
Route 845 To Route 17
Corner Store

<- Rt. 17 VA Rt. 245 I-66 Exit 31 ->



TARC Team Area



Flight Procedures 1

- First: go to REGISTRATION, get team materials
  - Name badges, parking pass, food tickets
  - Any rockets shipped ahead to Aurora
  - Registration today until 9:30, Saturday on the field
- Hangar11 Hobbies available tonight and on the field for pick-up/sale of rocket engines & supplies
- Rockets shipped ahead to Aurora Flight Sciences available for pickup tonight
- Altimeter sale and checkouts at Adept booth on field

Flight Procedures 2

- When teams arrive at the field Saturday, please park in the General Parking area
  - Do not arrive earlier than 6:30 AM
- Second: teams go to EGG ISSUE and select 1 egg
  - Each has its weight written on it
- Only student team members from this point on
  - All rocket prep, checkin, pad loading, etc. by students only
  - No one else in prep area or on the flying field
  - OK to have help for recovery outside flying field

Flight Procedures 3

- Third: up to 2 hours before "flight window" opens (but no later than 15 minutes before it closes) take complete rocket, with egg inside, altimeter and streamer outside, to CHECKIN
  - Certify that your team (students) and no one else built rocket, and it has flown before
  - Rocket will be weighed in flight-ready configuration, with engine(s) & egg: <1000 grams
  - Show your altimeter and your streamer
  - State exactly what engines from our list are in the rocket; do not exceed 125 grams propellant or 80 N-sec in total
  - Be prepared to show where "Center of Pressure" is located
  - Launch pad number has been pre-assigned

Streamer Guidelines

- Must be rectangular profile; 5:1 or more length to width; same thin, flexible material for whole length
- Leading edge stiffeners are OK, stiffeners down the length past first few inches are not
- Must be attached at one of the narrow ends only
- May use multiple streamers or multiple attachment points
- Must have a connection system that has a single line (not a loop) somewhere between streamer and rocket
- Must not have flaps, cups, bows or other attachments to the streamer but may have creases or curls of its single layer
- Courtesy check available tonight, will be inspected at checkin

Flight Procedures 4 & 5

- Fourth: pause for group photo in the photo tent if you want
  - Bring your own camera
- Fifth: after checkin, but no earlier than one hour before "flight window", students (only) go to assigned LAUNCH PAD and set rocket up
  - Pads are "hot" from previous round until 1 hour before yours
  - OK to use your own rod/rail/pad; we provide a ¼-inch/6-foot rod with 2 clips (12 VDC/18 amp) on an adjustable pivot
  - NAR "pad monitors" will help and direct you
  - Do not angle launch rod toward the spectators
  - If you have your own launch equipment, go to the pad early

Flight Procedures 6

- Sixth: Fly it! Do this anytime during your assigned one-hour flight window, your choice
  - Stand by your pad, hold up numbered "paddle" when ready to fly and have one team member join your timing team
    - Verify your altimeter is still beeping "flight ready" signal just before countdown starts
  - Once Range Safety Officer designates your pad for next launch, step 30 feet back and wait – wave to the crowd!
  - People at adjacent pads must step back when a pad is being flown – 30-foot standoff for everyone
  - If no flight by the end of "window," you're out
    - If your paddle is up by then and delay is ours, can still fly

Flight Procedures 7

- Seventh: return the egg and altimeter by 2:00 PM
  - Take to RETURNS before you leave the flying field
  - Leave egg & altimeter in rocket, remove when told
  - May have to return other parts of rocket if the RSO says so, due to rules-compliance concerns
  - If your rocket is on a power line LEAVE IT
  - If your rocket is in a tree, come get an NAR "returns judge" and a recovery pole
  - Reflight if rocket is seen but not safely reachable

Flight Procedures 8

- 20 teams from first flights will fly a 2nd flight in a "flyoff": top team from each round plus next 15 best overall
  - Top 10 places awarded based on sum of 2 flight scores
  - Remaining 90 places awarded based on 1st flight scores
- Top 20 teams posted on event scoreboard by 2 PM
  - Checkin opens as soon as these teams are announced
  - Flight window 3 PM to 4 PM, returns close at 4:30
  - Can keep original egg or get new one
- 21st – 25th place teams can fly again at 4 PM for a VIP demo launch (not scored) – checkin at 3 PM

Key Event Rules

- Egg/altimeter section must land without being caught and must use only streamer recovery
  - Rest of rocket may recover separately if desired and may use any safe means for recovery
- Every part that comes to earth separately must do so safely – recovery system or unstable tumbling
  - Ejected engine with no recovery system = DQ
  - Egg duration less than 35 seconds = DQ

Event Rules: Reflights

- Allowed if a rocket engine suffers a “catastrophic failure”, as judged by RSO/CD
  - Crashes or partial ignition of clusters are not “catastrophic failure”
  - Delay time errors must be massive and obvious
- Allowed if the egg/altimeter section lands in a place too dangerous to recover, as judged by NAR
- Allowed if an altimeter is judged by NAR to have failed to function despite being used properly
- No other reasons for second flights
- Flight window for these is 12:30 PM to 1:30 PM, must be returned by 2:00.

Event Rules: Disqualification

- "DQ" means flight score does not count
- Judged by RSO, can be appealed to Contest Director
  - Decision by CD on the field is final
- Based on one of three major factors:
  - Involvement in the flight by people other than student team members
  - Performance of rocket in flight – heavy pieces falling from sky at unsafe speed, no recovery
  - Non-compliance of rocket with event rules

Summary

- Safety is paramount – flight and recovery
- The rules are the rules for everyone
- Only the student team members participate
- Good sportsmanship is expected
- Scheduled events happen at scheduled times
- Everybody stays for the awards ceremony
- Treat the Great Meadow facility gently