



# NARTREK

## SILVER ACHIEVEMENT LEVEL

### HOW TO USE THIS PACKET

This online copy of the NARTREK Silver Achievement Level packet is for information only. Unlike our online Bronze packet, the Silver Level is not part of our special NARTREK promotion, and cannot be earned without preregistration.

Complete information on our special promotion is contained in our Bronze level packet.

Start on your NARTREK Bronze level today!



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### Welcome to the NARTREK Silver!

Congratulations on achieving the Bronze level! Your hard work has paid off and now you can begin the next step on the climb to the Gold: the Silver level. The Silver level is much like the Bronze, except that you will be working in four different areas instead of three. These new areas are a bit more challenging than the areas covered in the Bronze requirements, but you should be ready to tackle them with little problem.

NARTREK is providing you with plans for three vintage Estes cluster models, two boost glider plans and one rocket glider plan. Many more plans are available from the NARTREK database. We are also providing basic technical information on clustering and boost gliders.

We at NARTREK have had many questions dealing with the glider requirements so we will touch on them here. First, you may use either a rocket glider or a boost glider to meet the glider requirement. Second, you may use a glider kit from a model rocket company or build one from plans published in *Sport Rocketry* (or its predecessor magazines), the NARTREK database, NARTS or a NAR section newsletter. We only ask that you let us know where you got the plans (by providing the name of the magazine or newsletter, name of the design, date of the magazine or newsletter, etc.) and any other information that would be helpful.

If you are already familiar with custom designs, they may also be used. Just supply a brief description of the design.

You may build your cluster model from the plans provided, or use plans or kits from the same sources as outlined for boost gliders. Again, if you build from plans, let us know where you obtained them. We highly recommend that you use either a 12V launch system or use flash bulb ignition for your cluster flight. Six volt launch systems, such as those sold by Estes and Quest, will not reliably ignite clusters of even just two (2) standard igniters. If using flash bulb ignition, be sure to use a launch system that is 'flash bulb safe' in its continuity check.

As with the Bronze level, you are again restricted to a maximum of 'B' power for your duration (glide recovery) flight. For a real challenge, though, why not try to achieve the requirements using a 1/2A or A motor?



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Please remember that all flights must be returned and all flights must take place after you receive this packet to count. Be sure all of the forms are completely filled out and that the timers and scale judges have signed them.

By the way, any model rocket listed as scale or sport scale (but not scale-like) may be used for the scale requirement. There are still many good scale models on the market. Most model rocket companies have at least one, many have more.

Many participants have customized rockets suitable for the Bronze requirements. They are welcome to use them. The same applies to those who like to use old plans. Just supply a brief description of what you used. Ready-to-fly or borrowed rockets are still excluded. While kits are the best choice for beginners, experienced builders are free to use more advanced construction methods.

If you have any questions or problems please feel free to write, call or e-mail NARTREK Base. We are here to help you. We will answer by return mail or e-mail as quickly as we can.

Good luck, and have fun with this level!

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### Getting Started in BG and RG

The swift ascent of a boost or rocket glider, followed by a smooth transition to a slow, lazy and record-setting glide is the dream of many rocketeers. Unfortunately, for many modelers this type of flight remains a dream due to shreds, no transition to glide, or a poor glide trim.

The best way to get started in boost or rocket gliders is to build one of the plans we have provided. You can also learn a lot from reading articles on the subject. You will be learning from other's mistakes and saving balsa at the same time. The following publications are recommended reading for anyone interested in this aspect of rocketry:

G. Harry Stine, *Handbook of Model Rocketry*, Chapter 11, "Glide Recovery"

John Kaufmann, *Flying Hand-launched Gliders*, Wm. Morrow and Co.

Technical Publication #8, *Trimming Gliders*, Apogee Components

The remaining sources can be obtained through the NAR Technical Services, NARTS:

*LAC Competition Handbook*

*MIT Competition Design Notebook*

*Design Rules for Boost and Rocket Gliders*

*Record Setting Plans*



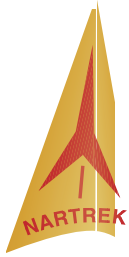
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### Requirements

1. Make a successful model rocket flight, built from an existing kit or existing plans, of a rocket carrying a payload. The payload may be a Grade A Large hen's egg, which must be flown and recovered without cracking the shell in any way. The payload may be a camera. If a camera is flown a picture taken from the in-flight rocket must be included with the certification documentation. The payload may be a transmitter or computer. If an electronic device is flown a photo of the device must be included in the certification documentation. Detailed notes on the function of the electronic device and a summary of any data gathered during the flight must also be included. You may choose to fly a NAR standard competition payload (refer to the Pink Book for details). You may not fly live animals of any type. Take a photograph of your model and attach it to the certification sheet after completely filling out the rest of the form.
2. Make a successful flight of a model rocket, built from an existing kit or built from existing plans, propelled by three (3) or more simultaneously firing model rocket motors. This may be the same model used for the payload requirement. It is not necessary to fly any payload for this requirement, however. Take a photograph of your model and attach it to the certification sheet after completely filling out the rest of the form.
3. Make a successful thirty (30) second duration flight of a glide recovered model rocket that you have built from an existing kit or existing plans. Take a photograph of your model and attach it to the certification sheet after completely filling out the rest of the form.
4. Build and successfully fly a scale model from an existing model rocket kit, or construct a scale model from basic parts using scale data obtained from the sources outlined in the accompanying documents. With a second party, make an honest evaluation of your model using the form provided. Alternatively, enter your model in a NAR sanctioned Scale or Sport Scale competition, and have the contest scale judges fill out the certification form. Take a photograph of your model and attach it to the certification sheet after completely filling out the rest of the form. We have included judging sheets for both Scale and Sport Scale judging.

**NOTE: Do not send individual requirement certification sheets to NARTREK BASE!** Wait until you have completed all four requirements before submitting your documents. Be sure to submit all four requirement certification sheets.



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## SILVER ACHIEVEMENT LEVEL

### Requirement Certification Sheet Payload Flight Requirement

I hereby certify that on \_\_\_\_\_(date)

I made a successful flight of a payload carrying model rocket that I built from an existing kit or from existing plans.

The rocket design was a \_\_\_\_\_,  
manufactured or designed by \_\_\_\_\_,  
using a type \_\_\_\_\_ motor  
manufactured by \_\_\_\_\_

Results of the flight, including description of payload. Use additional sheets if necessary:

Signed \_\_\_\_\_

Print Name \_\_\_\_\_

NAR # \_\_\_\_\_

ATTACH PHOTO OF MODEL BELOW



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## SILVER ACHIEVEMENT LEVEL

### Requirement Certification Sheet Cluster Flight Requirement

I hereby certify that on \_\_\_\_\_(date),  
I achieved a successful flight of a model rocket that was propelled by  
a cluster of \_\_\_\_\_ motors  
of type \_\_\_\_\_,  
manufactured by \_\_\_\_\_.

Describe the rocket kit or design name, manufacturer or source of plans, etc.:

Signed \_\_\_\_\_  
Print Name \_\_\_\_\_  
NAR # \_\_\_\_\_

ATTACH PHOTO OF MODEL BELOW



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## SILVER ACHIEVEMENT LEVEL

### Requirement Certification Sheet Glide Recovery Flight Requirement

I hereby certify that on \_\_\_\_\_(date),  
I achieved a duration of \_\_\_\_\_ seconds  
with a glide-recovered model rocket that I built from  
the existing model rocket kit (or design) \_\_\_\_\_,  
manufactured by (or published in) \_\_\_\_\_,  
using a type \_\_\_\_\_ motor  
manufactured by \_\_\_\_\_.

Signed \_\_\_\_\_

Print Name \_\_\_\_\_

NAR# \_\_\_\_\_

I hereby certify that I timed the above flight and that all records are correct.

Signed \_\_\_\_\_

Print Name \_\_\_\_\_

ATTACH PHOTO OF MODEL BELOW





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## SILVER ACHIEVEMENT LEVEL

### Requirement Certification Sheet Scale Model Construction and Flight Requirement

I hereby certify that on \_\_\_\_\_, (date)

I achieved a successful flight of a scale model of the  
\_\_\_\_\_ rocket,

and that on \_\_\_\_\_, (date)

I participated in the objective judging of that model and recorded the results on the attached scale judging sheet.

Signed \_\_\_\_\_

Print Name \_\_\_\_\_

NAR# \_\_\_\_\_

#### Scale Judge's Certification

I certify that I assisted the above person in an objective judging of the scale model rocket and recorded my findings on the attached scoring worksheet.

Signed \_\_\_\_\_

Print Name \_\_\_\_\_

ATTACH PHOTO OF MODEL BELOW



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## SILVER ACHIEVEMENT LEVEL

### Requirement Certification Sheet Scale Model Scoring Worksheet

Description of Scoring	Max Points	Score
1. <b>Scale Data:</b> Judge on quality, not quantity. Should show all details modeled. Must show major dimensions of prototype modeled. Scale factor and scale dimensions should be given.	50	
2. <b>Adherence to Scale:</b> Judged in the following areas:		
Accuracy of Major Dimensions	200	
Color and Markings	100	
Accuracy of Details (Antennas, rivets, cover plates, bolts, etc.)	50	
3. <b>Degree of Difficulty:</b> Judged on the difficulty experienced by the modeler in building the model. Judged equally on difficulty of modeling the prototype and difficulty of construction.	100	
4. <b>Craftsmanship:</b> Judged on neatness, care in construction, craftsmanship of details, quality of finish	300	
5. <b>Flight Characteristics:</b>		
Mission: Judged on appropriate and scale-like operation of the model. Examples are staging, simulated cloud seeding, and smoke ejection.	200	
General Flight: Judged on launch, stability of flight, recovery and lack of damage on landing.	100	
<b>Total Score (Points Awarded)</b>	<b>1100</b>	

Note: The judging results from a Scale Competition of any type (Sport, Scale, Super Scale, etc.) held at a NAR sanctioned competition may be substituted for the above form.

Signature of Modeler: \_\_\_\_\_ NAR # \_\_\_\_\_

Signature of Judge: \_\_\_\_\_