It's Very Popular Education Program at Science Museums in Japan – Make Your Own Telescope to Explore the Universe –

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The article is aimed for introducing a simple program, that is significant service of museum.

1. Why Telescope Making, it is Japanese culture specific.

The Spica [supika] telescope now distributing had been developed 1988. My origin attempting to make telescope for me, it was because of my curiosity about the telescope that makes object in distance invisible visible. The challenge had been done about 1941 when I entered primary school. For I could get small single lens and concave ocular lens in a blue box at a shop. Somehow it was hard work to make the tube and it was gappy one I made and it result barely placing the lens. However, I still remember the image of the moon with the very telescope and received a shock. Because moon was unusual, It was not pearly face. I could watch a fascinating pattern (lowland and highland of the moon).

Growing and mean while I got job with my father's shop deal optical toy called King Shokwai.

On the job, My wishes revived the early memory of the telescope making. I thought telescope kit that should be provided with sturdy tube and it will be welcome among young students. Prototype of KOL Kit Telescope assembly Kit was born 1963.

Here under you will see the copy of assembly kit products catalog.

It was an era there are no commercial telescope except low quality toy telescope.

KOL kit had also of optical configuration with single lens and hygenian ocular lens included. But They were good sales, summer season was very busy for the delivery. Even though they have the strong chromatic aberration and it was hard to see the ring of Saturn. However I know a famous professional astronomer in Japan who bought the kit in his primary school days. As such, as of now those who are planetarian, high school teachers of physics, when they were young students, it was so many who get started with such telescopes built by them and accordingly it might ignite the interest in astronomy. This is the story of an early KOL Kit time.

Before taking next step, Please be noted again a story of telescope making by Minoru Honda.

He strongly loved to see night sky and he strongly wanted to have a telescope, however despite his desire, it was absolutely impossible to buy telescope so expensive. Then he bought 28mm single lens and 25mm Ramsden eyepiece for making telescope own 1923. This interesting story is edited impressively in Astronomy Herald December 1990 Vol.33 NAOJ. He told I still remember stunning image of the moon through the first telescope I made, And he mentioned it can affect

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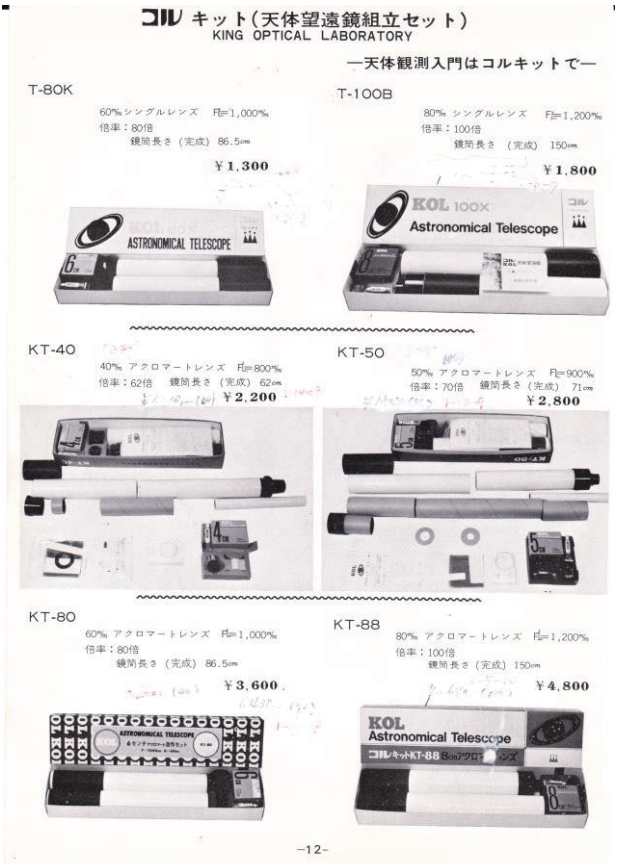

Fig. 1 Catalog King Shokwai 1970

the persons' later life in the initial experience in life. Later he will be famous astronomer; you can check him with WiKipedia.

Telescope making is the vast, yet simple gateway where find a key to kindle the interest in science via Astronomy.

2. Research: How people buy KOL Kit since 1963 to 1988 Social marketing.

And then I took a steps to the debut of Spica telescope kit, Low cost yet high performance, but I declare that these steps was developed with the new wave that strongly encouraged me, it was by Blurry the KOL Kit users.

What is they wanted. Conclusion, as the result, I found the telescope what should be of sufficient quality to ignite an interest in astronomy among young people.

The telescope should have magnification and price to be as low as possible, yet discerning the ring of Saturn. Lower magnification permits to use one with no

Fig. 2 Workshop easy to join and send happy hour. It might be said **Astronomy for the people.**

finder scope and also do to use photographical tripod unstable for the astronomy use. And it is easy to buy in any town. Finally, size of telescope should be appropriately short in length and weight, convenient to be handled by the arms of young student's around age 9 to 11, called golden age.

Telescope making among young students is the Japanese tradition fostered by young people.

The telescope making workshop adopted with the Spica[supika], it was initially implemented at Osaka Science Museum. The workshop was call for 50 participants in summer season, but it resulted the audiences about 550 by application mails received.

Board of the museum took a way to accept participants by picking in the fair lottery.

After the workshop of Osaka Science Museum, such workshop was expanded nation wide.

Though it was the time of popular commercial telescope is coming in the market.

The following page is workshop scenes–still images.

Fig. 3 Entry

3. It is happy

Participants spent happy hours with the workshop.

You will be able to understand their hour, as conclusion, with hearing joy for glee here and there, when they focus on the crescent moon with the telescope they made.

At this point, please to consider the conception of the making. When you see the moon through a telescope shown by astronomers or teachers, you may be delighted and astonished in the image but it will be different from the image through the telescope made by own hand work.

For instance you may agree, if you can touch a collection of a museum, the reality of it's comprehension will be grown that is recognize with two senses touch and watch rather than just watching the collection with your eyes only. The case of making will be done by using five senses, His telescope is the tool made by his five senses for the purpose to be satisfied to see the distance. The tool is extension of hand for himself.

When you see something using with your tool, you can recognize it as if concentrating your five senses.

This is the ultimate reality of seeing.

Accordingly I wanted to expand this happy experience born with the workshop for the world.

I took IAU the best opportunity and I offered the poster presentation for IAU Praha 2006 GA. Please be noted this was made by very small company workers less ten who organize good affiliates, also the presenter had never have a experience of presentation for a conference even in domestic. We were just a vender. But contents was large, it was the first encounter of innovation for the top end astronomers' organization IAU.

At the poster session IAU said it is the most impressive poster. And mentioned, I visited your poster, "I was interested in your Spica telescope kit as a model for what a model the IAU wants to develop for the International Year of Astronomy 2009, which I hadn't actually seen "in person."

Because of the workshop is so easy and simple that the participants are pleased to join the workshop again as the assistant teacher. This is happy contribution.

Fig. 4 Set sheets and waiting for the begin

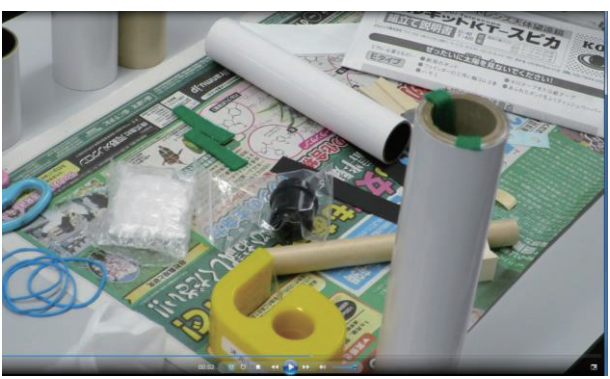

Fig. 5 on a step for making telescope

Fig. 6 installing objective lens

Fig. 7 pointing; practical training

Fig. 8 focusing object

Actually over the ten years these happy contribution is being continued with teams by now including old or young alike, members of NPO the Little Astronomers. Is it why? Happy to participate and again happy to contribute on it.This is the law of square by the happiness! That law is advocated by professor Dr. Shinpei Shibata Yamagata University Japan

Fig. 9 Focused on

Fig. 10 Practical training; Focusing

References

[1] Movie at Workshop from the entrance to the Finish https://youtu.be/bv4OL9w-vOA
[2] Poster IAU2006 http://www.orbys.co.jp/eng/2006/iau2k6.pdf
[3] Material information http://www.orbys.co.jp/kolkit/