

# RMO 网页翻译

柚子星空

## 一、介绍

此网址为：<http://www.amro-net.jp/about-hro/index-eng.html>，本次翻译的是“about RMO”板块（红框所示），采用截图加中文翻译的形式进行。

The screenshot shows the homepage of 'The International Project for Radio Meteor Observation'. The title is in a large, stylized orange font. Below it is a navigation bar with links: HOME, about RMO (highlighted with a red box), Showers, Results, RMOJ, Live, Research, Link, About, Copyright, and Contact. The left sidebar contains several menu items: 'about RMO' (with sub-links: Mechanism, Why observe?, Kind of RMO), 'RMO in JAPAN' (with sub-links: History, Transmitting Sta., Recieving Sta., HROFFT software), 'HROFFT software' (with sub-links: anout HROFFT, how to analyze, Instructions), 'How to analyze' (with sub-links: HROFFT, FFTDSP), and 'Send to' (with sub-link: Send your data). The main content area is titled 'HOME > about RMO' and contains several sections: 'What is Radio Meteor Obseration ?' (with a paragraph about the page's content), 'The mechanism and feature of Radio Meteor Observation' (with a list of links: Mechanism, Why observe ?, Kind of Radio Meteor Observation), 'Japanese Radio Meteor Observation' (with a list of links: History, Transmitting Stations and using frequencies, Receiving Stations (using devices), Useful Software "HROFFT"), 'How to Analyze' (with a paragraph about counting and analyzing data), 'Report' (with a paragraph about sending reports), and a 'send your data' button. The footer contains copyright information: (C)2000-2017 All Rights Reserved , The International Project for Radio Meteor Observation, and a design credit: 21542600(design by tempnate).

**The International Project for Radio Meteor Observation** [Japanese page](#)

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**about RMO**

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**RMO in JAPAN**

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**HROFFT software**

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**How to analyze**

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HOME > about RMO

**What is Radio Meteor Obseration ?**

This page provides contents of "What is Radio Meteor Observation ?" and information of Japanese Radio Meteor Observation.

**The mechanism and feature of Radio Meteor Observation**

- (1) [Mechanism](#)
- (2) Why observe ?
- (3) Kind of Radio Meteor Observation

**Japanese Radio Meteor Observation**

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- (3) [Receiving Stations \(using devices\)](#)
- (4) [Useful Software "HROFFT"](#)

**How to Analyze**

After you get great data, let's count and anylze data. Besides, we looking forward to reporting your data.

- (1) [How to count in the case of HROFFT](#)
- (2) [How to count in the case of FFTDSP4](#)

**Report**

After you analyze, please send me your repot. This project analyzes worldwide data and total activities of meteor showers.

[send your data](#)

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## 二、about RMO

### 1、Mechanism

## What is Radio Meteor Observation ? (mechanism)

This page has contents about Radio Meteor Observation. There are many detail information on the other homepage. Please show other homepage from LINK page, too ! Radio Meteor Observation is very useful to know the meteor activity. Let's start to observe and join our international radio project !!

### 什么是无线电流星观测？（机制）

本页有关于无线电流星观测的内容。有许多详细信息在其他主页。请从链接页显示其他主页。无线电流星观测对于了解流星活动很有用。让我们开始观测并加入国际无线电项目中。

#### Mechanism

Radio Meteor Observation uses VHF(30MHz-300MHz) radio wave. A VHF transmitting station is located at a very far distance from observing (receiving) station. It therefore is impossible to receive the direct radio wave from transmitting station at receiving station. When a meteor enters atmosphere, it ionizes atmosphere and separates between free electrons and plus ions. Then the density of electrons increase and an "ionized trail" is produced around there. Free electrons has a principle which is scattering of VHF radio wave. When a meteor appears, therefore, we can receive VHF radio wave from ionized trail at receiving station. The right figure is the image of mechanism of meteor scattering.

#### 机制

无线电流星观测使用 VHF(30MHz-300MHz)无线电波。一个 VHF 发射站在离观测（接收）站很远的地方。因此不可能在接收站直接接收到来自发射站的无线电波。当流星进入大气层，其会电离大气层并分离成自由电子和正离子。然后电子密度增加，那周围就会有一条我们造出来的“电离轨迹”。自由电子有个准则是 VHF 无线电波的散射。因此，当流星出现时，我们可以在接收站接收到来自电离轨迹的 VHF 无线电波。右图是流星散射机制的图。

Radio Meteor Observation has two observing methods. One is a back scattering and another is a forward scattering. The back scattering has a principle which is that the receiving and transmitting stations are located at same position. It therefore is possible to obtain detail meteor information such as meteor geocentric velocity and beginning and ending height. This observation is also called "Radar Observation". Although this method is useful for analyzing meteor phenomenon, it needs a lot of costs. It therefore is difficult for amateur observers to do. The forward scattering observation is major observation because this method is very easy and simple to start. There are over 150 observing stations in the world. In particular, there are many observing stations in Japan. Although this observation is simple, there are some serious problems. One of them is the characteristic of reflection mechanism. The forward scattering basically satisfies that incident angle is equal to reflection angle. The reflection point changes and depends on the change of radiant elevation. We therefore have to understand characteristics of forward scattering observation well.

无线电流星观测有两种观测方法。一种是后向散射，一种是前向散射。后向观测的原理是接收和发射站在同一地点。因此有可能获得流星的详细信息，比如流星地心速度和起止高度。这也被称为“雷达观测”。虽然这种方法分析流星现象很有用，但需要大量成本。因此对于业余观测者来说很难做。前向散射观测是主要的观测，因为这种方法开始非常容易、简单。全世界有 150 多个观测站。特别是在日本有许多观测站。虽然这种观测简单，但也有一些严重的问题。其中之一是反射机制的特点。前向散射主要满足入射角等于反射角。反射点的变化取决于辐射点仰角的变化。因此，我们不得不好好了解前向散射观测的特点。

Like this , Radio Meteor Observation mainly means the forward scattering. Of course, by using radio wave, it is possible to observe and monitor meteor activity even if in bad weather and at daytime. Then if there is a stable transmitting station, it becomes possible to observe continuously by using computer and observing software. Since observing equipments are not expensive, it is easy to start.

像这样，无线电流星观测主要是前向散射。当然，使用无线电波，即使在坏天气或白天也能观测和监测流星。如果有一个稳定的发射站，那就可以用电脑和观测软件连续观测。既然观测设备不贵，那就容易开始。

### Using frequency type

When you start Radio Meteor Observation, you have to select the transmitting station. There are many VHF radio stations in the world, you have to select the best transmitting stations. Generally, Japanese and Korean observers can use Ham-band radio wave at 53.750MHz (located at Fukui, Japan). In Europe, many observers use TV radio wave and FM broadcast radio wave at about 50 - 90MHz. In Europe, however, the Ham transmitting station will be installed soon around 50MHz. European observers, therefore, please contact me. I give you the latest information. Then American observers use FM broadcast stations around 80MHz. Some observers, however, use TV radio wave at around 50MHz. Since many radio observers use around 50MHz radio band, you had better select 50MHz radio transmitting station. If you do not find the transmitting station, please contact me. I introduce a radio observer in your country (or area).

#### 使用的频率类型

当你开始无线电流星观测时，你不得不选择发射站。全世界有许多 VHF 无线电站，你必须选择最好的发射站。一般来说，日本和韩国的观测者可以用 53.750MHz 的无线电爱好者频段无线电波（位于日本福井）。在欧洲，许多观测者用大约 50-90MHz 的电视无线电波和调频广播无线电波。然而在欧洲，50MHz 左右的无线电爱好者发射站不久将会被安装。因此，欧洲的观测者请联系我。我给你们最新的消息。美国观测者用 80MHz 左右的调频广播站。但是一些观测者用 50MHz 左右的电视无线电波。由于许多无线电观测者用 50MHz 左右的无线电频段，所以你最好选择 50MHz 的无线电发射站。如果你找不到发射站，请联系我。我在你们国家（或地区）介绍一位无线电观测者。

#### 2、Why observe

##### Why observe ?

Under Construction....

I am sorry, please just a moment

#### 3、Kind of RMO

##### Kind of Radio Meteor Observation

Under Construction....

I am sorry, please just a moment

### 三、RMO in JAPAN

#### 1、History

## History of Japanese Radio Meteor Observation

In '1980s, Mr. Kazuhiro SUZUKI started to do Radio Meteor Observation using FM broadcast radio wave. This is the first time in the forward scattering observation in Japan. This observation became famous in the world, many meteor shower activity and outbursts were caught and analyzed. In '1990s, in Japan, the number of FM broadcast stations increased and it became difficult to observe FM observation (FRO). In 1996, the ham beacon station, Mr. Kimio Maegawa suggested to use Ham-band for meteor observation. This is Ham-band Radio Observation called HRO. The transmitting station is very stable and transmits continuous radio wave. Radio observers therefore possible to observe continuously. In 2000, Mr. Kazuhiko Ohkawa developed an observing software under Windows operating system and an inexpensive receiver for 53.750MHz only. By developing these two observing equipments, it becomes very easy to start Radio Meteor Observation in Japan. In particular, the 53.750MHz receiver is made in Japanese company, ITEC. The cost is about 9,800YEN (Japanese yen). By these developing and making HRO observers network since 2001, the number of observing stations increases and there are over 100 observing stations in Japan now.

### 日本无线电流星观测的历史

在 20 世纪 80 年代，Kazuhiro SUZUKI 先生开始用 FM 广播无线电波做无线电流星监测。这是日本第一次的前向散射观测。这次观测闻名于世，许多流星雨活动和爆发被捕捉和分析。在 20 世纪 90 年代，日本的 FM 广播站数量增加，FM 无线电观测变得困难。1996 年，无线电业余爱好者信标站，Kimio Maegawa 先生建议使用业余爱好者频带来做流星观测。这种观测称为 HRO。发射站很稳定，发射连续的无线电波。因此无线电观测者有可能连续观测。2000 年，Kazuhiko Ohkawa 先生开发了一款在 Windows 操作系统下的观测软件和一个便宜的只有 53.750MHz 的接收机。通过开发这两个观测设备，在日本开始无线电流星观测变得很容易。特别是 53.750MHz 接收机是日本公司 ITEC 制造的。价格大约 9800 日元。自从 2001 年开始，通过这些发展和建立 HRO 观测者网络，观测站的数量增加，现在有一百多个观测站。

### 2、Transmitting Sta.

## Transmitting Stations and using frequencies

In Japan, the most famous frequency is 53.750MHz (Ham-band). The transmitting station is located at Fukui, Japan. As other frequency, Japanese observers use 28.208MHz (Ham-band). And some observers also use VOR (VHF Omni directional Range) at 108MHz - 118MHz. The countable meteor echo number becomes low count using higher frequency. Japanese observers therefore adopt 53MHz radio wave. 28.208MHz radio wave is used for detection of darker meteor echoes.

### 发射站和使用频率

在日本，最有名的频率是 53.750MHz（业余爱好者频带）。发射站位于日本福井。像其他频率一样，日本的观测者使用 28.208MHz（业余爱好者频带）。一些观测者还用 108MHz-118MHz 的 VOR（甚高频全向信标系统）。可数流星回波数量随使用频率增大而减少。因此日本观测者采用 53MHz 的无线电波。28.208MHz 无线电波被用来探测更暗流星的回波。

## about Transmitting Station

As above, there are some transmitting stations in Japan.

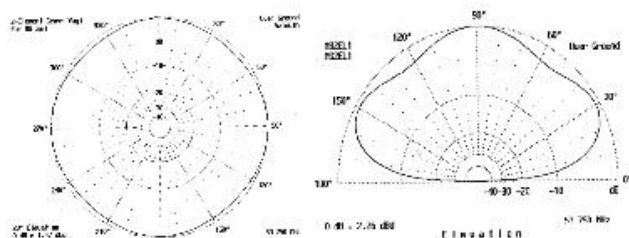
### 关于发射站

如上所述，日本有一些发射站。



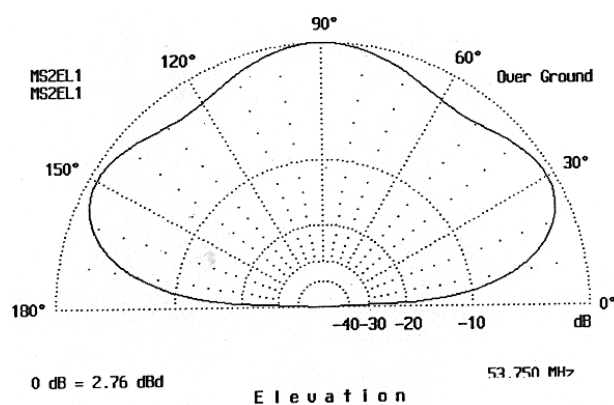
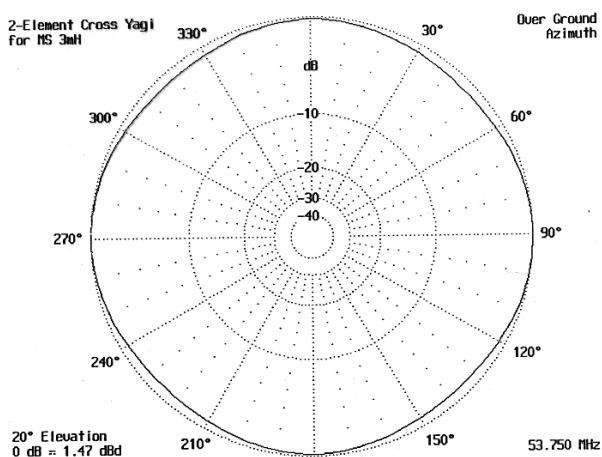
## HRO at 53.750MHz (located at Fukui, Japan, transmitted by Kimio MAEGAWA)

This radio wave is beacon in Ham-band. The transmitting power is 50W and the cross Yagi antenna is setup. The radio wave of this station is very stable and continuously at all times for ham commnication. Japanese radio observers use this frequency. The right picture is transmitting antenna (left). The following is the antenna pattern simulation by Mr. Kimio Maegawa.



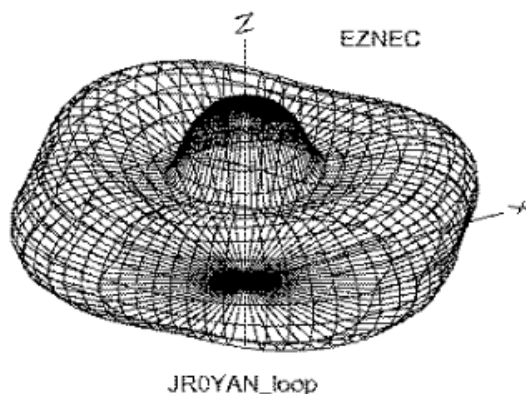
### 53.750MHz 的 HRO (位于日本福井, 由 Kimio MAEGAWA 发射)

这个无线电波是业余爱好者频带里的信标。发射功率为 50W, 安装的是十字八木天线。此站的无线电波很稳定, 全时段连续用于业余无线电爱好者通信。日本的无线电观测者用此频率。右图是发射天线 (左)。下面是 Kimio Maegawa 先生做的天线模式仿真。



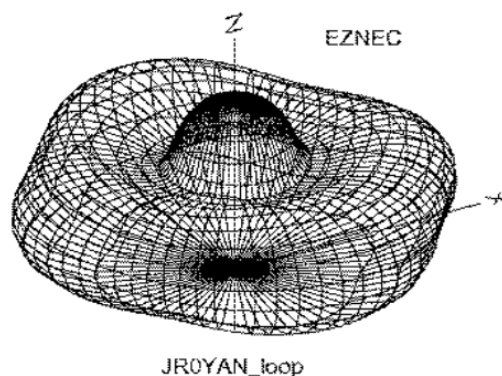
## HRO at 28.208MHz (located at Nagano, Japan, transmitted by Noriyuki YAGUCHI)

28.208MHz observation started since November 2002 for detecting fainter meteor of Leonids. Since 2002 Leonids, 28MHz observation has caught many meteor showers and interesting results. This frequency is expected to catch darker meteor activity than 53MHz observation. This is because the underdense (the electron density on the ionized trail is lower than  $10^{14}$  electrons per meter) causes Heigh Ceiling effect. This effect determines limited height of detection of ionized trail. Although there are many problems, this observation will be useful for researching the mass distribution (I think ...). The antenna pattern at transmitting station is shown in right figure. The transmitting power is 50W with CW radio wave.



### 28.208MHz 的 HRO (位于日本长野, 由 Noriyuki YAGUCHI 发射)

28.208MHz 观测从 2002 年 11 月开始, 用来探测狮子座流星雨更微弱的流星。从 2002 年狮子座流星雨以来, 28MHz 观测已经捕捉了许多流星雨和令人关注的结果。这个频率有望比 53MHz 观测捕捉更暗的流星活动。这是因为低密度 (电离轨迹上的电子密度低于每米  $10^{14}$  个电子) 导致高天花板效应。此效应决定了探测电离轨迹的限制高度。虽然有许多问题, 但此观测对研究质量分布将有用 (我认为...)。发射站的天线模式如右图所示。发射功率 50W 的连续波。



### 3、Receiving Sta.

#### Receiving Stations (using devices)

At receiving station, we receive radio wave from transmitting station using antenna and receiver. Then, the sound output from receiver send to computer LINE-IN. Then, this signal is analyzed by observing software "HROFFT" with FFT. On the screen, we can see the FFT results with spectrum of intensity. The sample image is as following. The horizontal axis means time scale. The FFT is done every 0.5second. The vertical axis means the frequency. Since the ionized trail is distributed after meteor appears, we can see the Doppler shift. As very important thing, this doppler shift does not mean meteor doppler. The meteor doppler is called head echo. The doppler shift of head echo is much wider than doppler shift of distribution of ionized trail.

#### 接收站 (使用装置)

在接收站, 我们用天线和接收机接收来自发射站的无线电波。接着, 接收机的声音输出发送到计算机的音频输入。然后, 该信号被 "HROFFT" 软件的 FFT 分析。在屏幕上, 我们能看到谱线强度的 FFT 结果。示例图像如下所示。横轴表示时间刻度。FFT 每 0.5 秒做一次。纵轴表示频率。流星出现后, 电离轨迹分布, 我们可以看到多普勒频移。很重要的是, 多普勒频移并不意味着流星多普勒。流星多普勒称作头回波。头回波的多普勒频移比电离轨迹分布的多普勒频移宽的多。

## Receiver

In Japan, the most famous frequency is 53.750MHz. In 2000, Mr. Kazuhiko Ohkawa therefore developed the receiver at 53.750MHz only. (If you configure at your using frequency, you can use this receiver.) Since this receiver is used at only 53.750MHz, the cost is too inexpensive which is about 9,800YEN (about 90US\$). The overview of this receiver is as right picture. This receiver was provided ITEC corporation. Since it is too inexpensive to get this receiver, many observers started Radio Meteor Observation in Japan.



### 接收机

在日本，最著名的频率是 53.750MHz。因此，2000 年时 Kazuhiko Ohkawa 先生只研制了 53.750MHz 的接收机。（如果你设置使用频率，可以使用该接收机。）由于该接收机只用于 53.750MHz，所以价格很便宜，大约 9800 日元（约 90 美元）。接收机的样子如右图所示。该接收机由 ITEC 公司供应。由于得到该接收机太便宜，日本许多观测者开始了无线电流星观测。



## Antenna

Since Japan is very small country and transmitting power is 50W, Many Japanese observers use HB9CV 2el. antenna. The antenna image is as right picture. The antenna direction depends on the distance between transmitting and receiving stations and also decide observing conditions around receiving station. Many observers located in less than 200km, the antenna is turned to the zenith. In over 200km observing area, some observers turn to the zenith and some observers turn to the horizon.



### 天线

由于日本是很小的国家而且发射功率有 50W，所以许多日本观测者使用 HB9CV 2el 天线。天线图像如右图所示。天线方向取决于接发站之间的距离，也由接收站周围的观测条件决定。许多观测者位于 200km 内，天线就转向天顶。在超过 200km 的观测地区，一些观测者转向天顶，一些则转向地平线。



## Analysis

The counting is very important work for analyzing meteor shower activity. We count the number of meteor echoes and report to worldwide network. Japanese observers report to The International Project for Radio Meteor Observation, and this project reports to RMOB. The number of observing stations increase and many observing stations are monitoring meteor activity at all times. The counting method is written [in this page](#). Please see this page.

### 分析

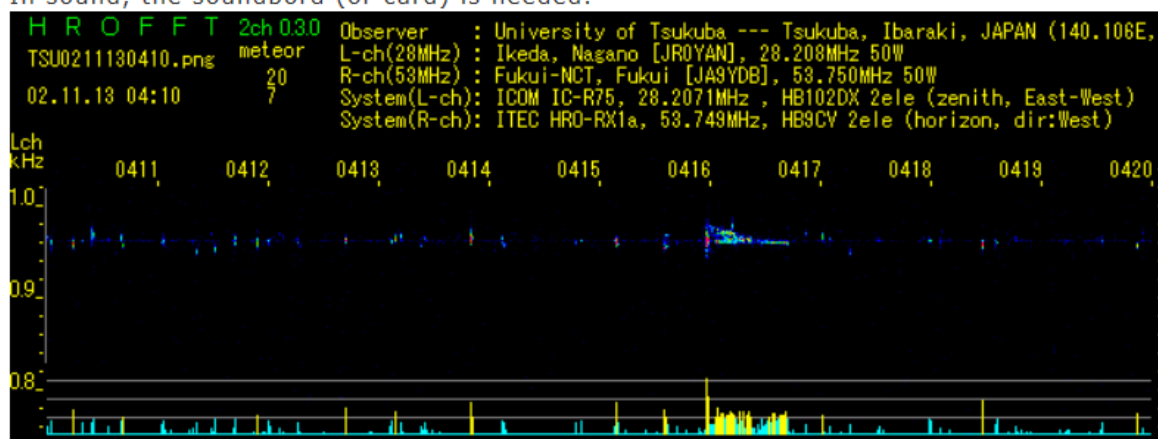
计数是分析流星雨活动非常重要的工作。我们计数流星回波数并向全球网络报告。日本观测者向 The International Project for Radio Meteor Observation 报告，该项目再向 RMOB 报告。观测站数量不断增加并且许多观测站在一直监测流星活动。计数方法写在这页，请参阅该页。

### 4、HROFFT software



## Useful Software "HROFFT"

This software was developed by Mr. Kazuhiko Ohkawa as I wrote. If you want to use this software, please contact me ( [info-web@amro-net.jp](mailto:info-web@amro-net.jp) ). Almost of Japanese observers use this software, and many observers in the world also use this software. The biggest merit is to work under Windows operating system. I recommend that using computer has over 133MHz CPU and over 32MB ROM. This software works under Windows95, 98, Me, 2000, XP. Of course, this software analyzes Line-In sound, the soundbord (or card) is needed.



### 有用的“HROFFT”软件

正如我写的那样，该软件由 Kazuhiko Ohkawa 先生开发。如果你想使用这个软件，请联系我 ([info-web@amro-net.jp](mailto:info-web@amro-net.jp))。日本的观测者几乎都用该软件，全世界许多观测者也用该软件。最大的优点是在 Windows 操作系统下运行。我建议使用 133MHz 以上 CPU，32MB 以上 ROM 的计算机。该软件在 Windows95，98，Me，2000，XP 下运行。当然，该软件分析音频输入的声音，需要声卡。

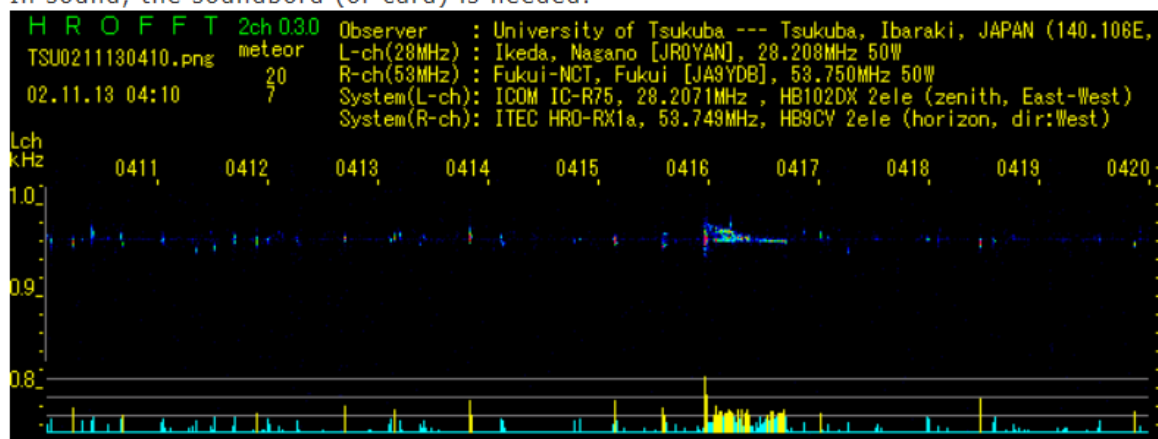
## 四、HROFFT software

### 1、anout HROFFT



## Useful Software "HROFFT"

This software was developed by Mr. Kazuhiko Ohkawa as I wrote. If you want to use this software, please contact me ( [info-web@amro-net.jp](mailto:info-web@amro-net.jp) ). Almost of Japanese observers use this software, and many observers in the world also use this software. The biggest merit is to work under Windows operating system. I recommend that using computer has over 133MHz CPU and over 32MB ROM. This software works under Windows95, 98, Me, 2000, XP. Of course, this software analyzes Line-In sound, the soundbord (or card) is needed.



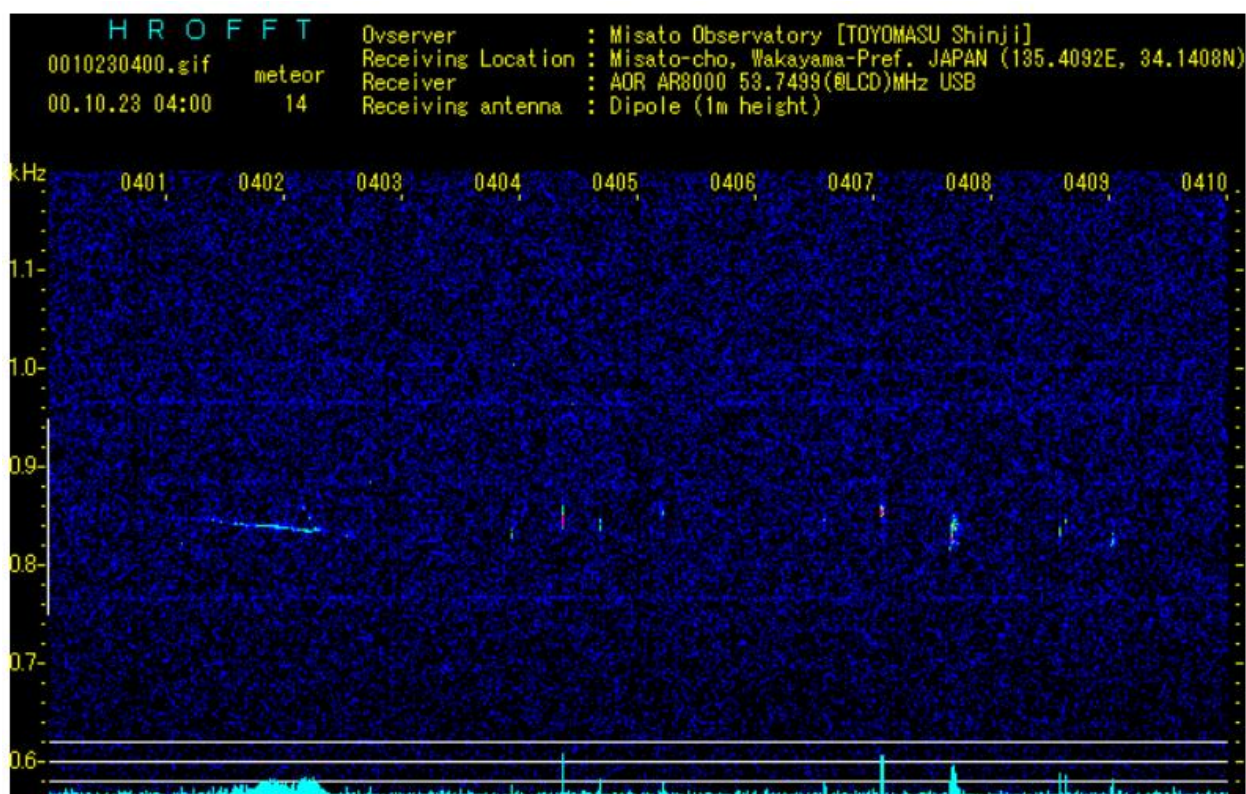
## 2、how to analyze

### How to count in the case of HROFFT

This software was made by K. Ohkawa (JAPAN). It operates on Windows. Data for 10 minutes preserve as one figure. So, for 1 day, we can get 144 figures!! The size of one figure is usually 20KB-40KB. The following figure is the data gotten by HROFFT.

#### 就 HROFFT 来说如何计数

该软件由 K. Ohkawa (日本) 制作。它在 Windows 上运行。10 分钟保存为一张图。因此，我们一天能得到 144 张图！一张图的大小通常 20-40KB。下图就是 HROFFT 得到的数据。



This is the observational data. Its file size is 31KB.

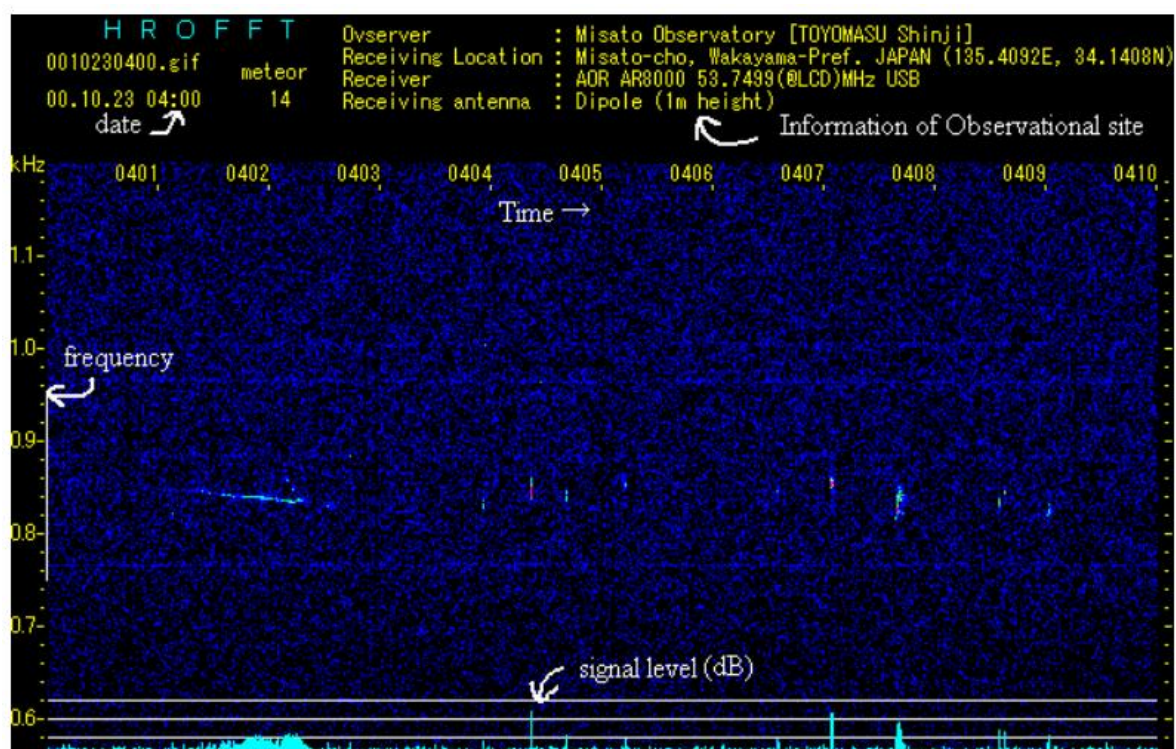
(Attention: The upper figure is pressed (change 256 colors into 16 colors) because of curtailment of file size.)

这是观测数据，其文件大小为 31KB。

(注意：上图被压缩过，256 色变为 16 色，因为文件大小的限制。)

The following figure is meaning of data.

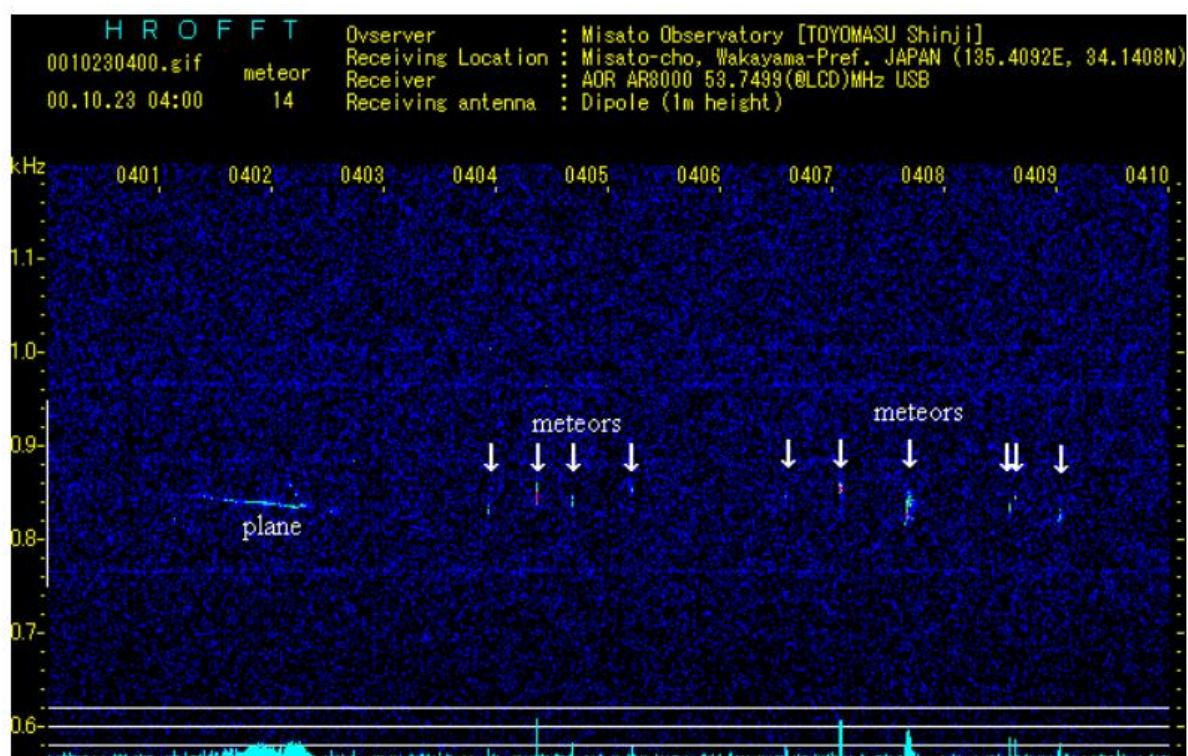
下图是数据的含义。



On upper figure, meteors are lengthwise lines. These are radio wave(echo) reflected by meteor. On the left hand, we can see horizontal line. This is plane. The frequency is changed by Doppler-effect. The following figure is to be arranged upper explanations.

在上图中，流星是纵向线条。这些是被流星反射的无线电波（回波）。在左边边，我们可以看到水平线条，这是飞机。多普勒效应改变了频率。下图是对上面解释的整理。

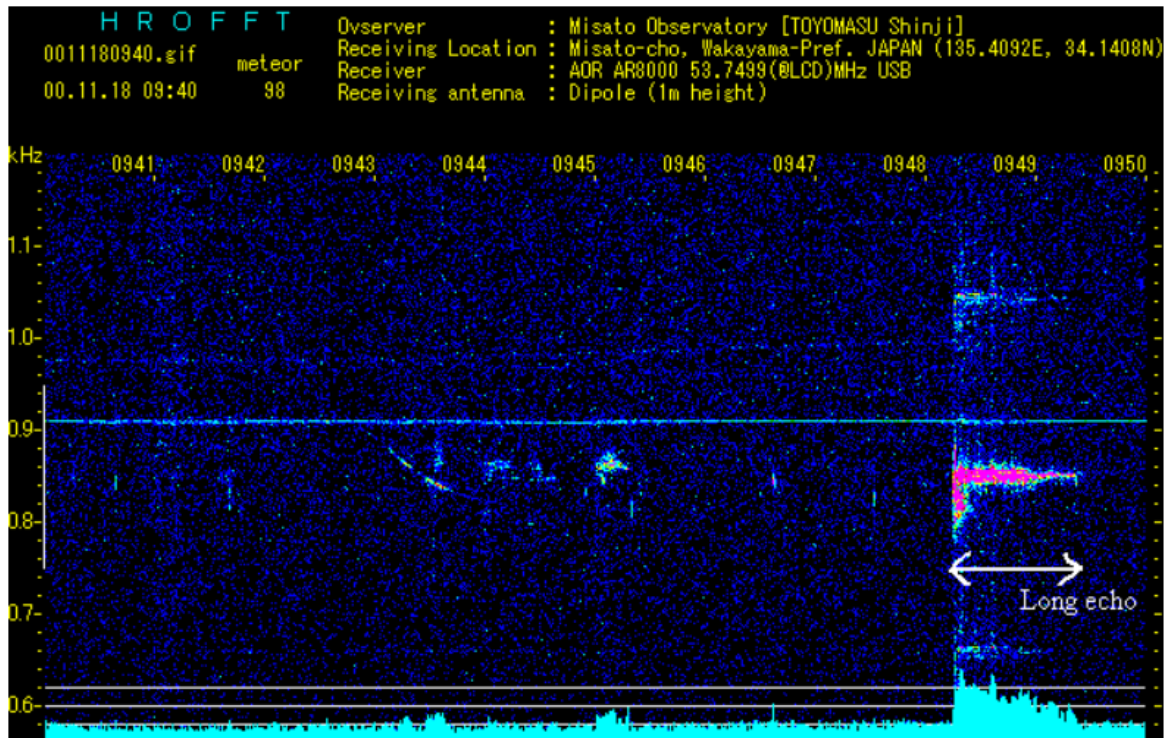




Like upper figure, we record the number of echoes every one hour. Also, sometimes, we can get very long echoes. The following figure is data in Leonids.

像上图一样，我们每小时记录一次回波的数量。有时我们还能得到非常长的回波。下图是狮子座流星雨的数据。

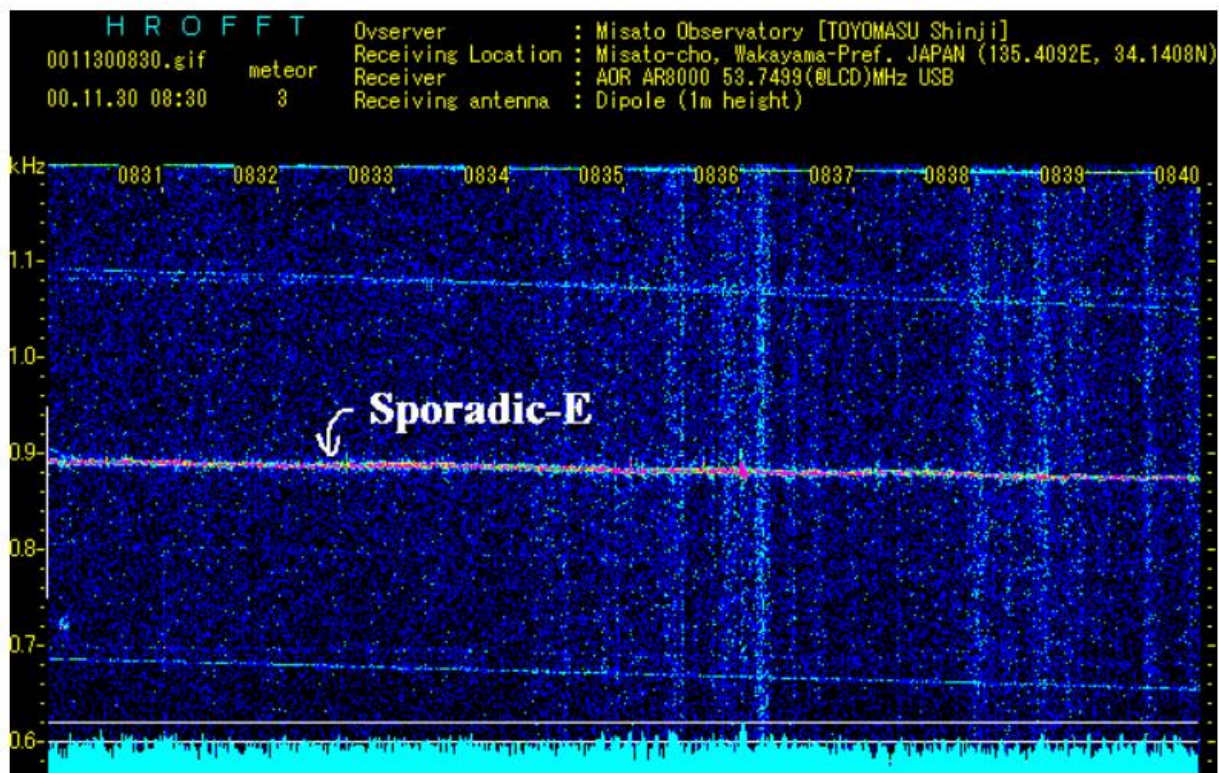




1 dot is 1 second. So, you can see how long did the echo keep. It seems the long echoes is occurred by meteor trail. At the same time, we can think that the meteor is big. At Misato Observatory, the echo which keeps more than 20 seconds is long echo. At Chigusa High School, however, the echo which keeps more than 10 seconds is long echo. Because the surrounding environment of Chigusa High School is worse than the definition of long echo. In addition, when activity of the sun is active. Sporadic-E, radio noise or interference occur. When these occur, we can't observe.

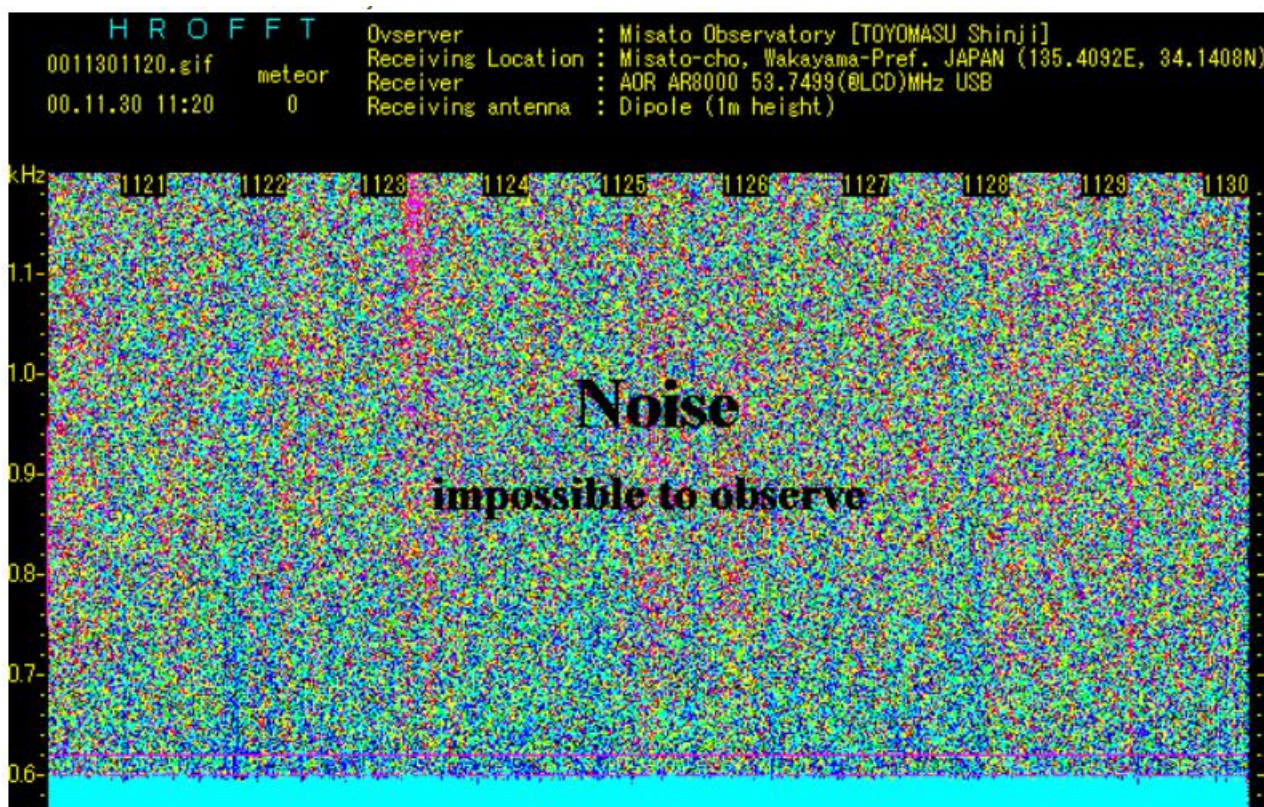
一点是一秒。因此你可以看到回波持续多久。似乎长回波是由流星轨迹产生的。同时，我们可以认为流星是大的。在美里天文台，持续 20 秒以上的是长回波。然而在千草高中，持续 10 秒以上的是长回波。因为千草高中周围的环境比长回波的定义要更差。另外，当太阳活动活跃时，偶发 E 层、无线电噪声或干扰出现。当这些出现时，我们不能观测。





Upper: Sporadic-E (sign:Es, file size:61KB) / Following: interference (sign:IF, file size:93KB)  
(Attention: The upper figure is pressed(change 256 colors into 16 colors) because of curtailment of file size.)

上图：偶发 E 层（信号：Es，文件大小：61KB）/下图：干扰（信号：IF，文件大小：93KB）（注意：上图被压缩过，256 色变为 16 色，因为文件大小的限制。）



### 3、Instructions

#### How to use HROFFT software ? (instructions)

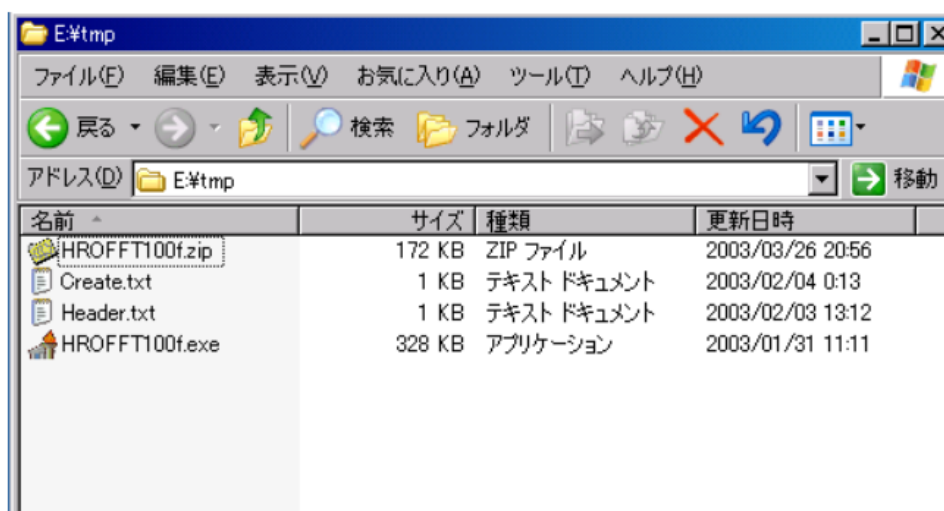
HROFFT software was developed by Mr. Kazuhiko OHKAWA in 2000. This software works under Windows Operating System (Windows 95, 98, 98SE, Me, 2000, XP). This page introduces instructions of HROFFT software. If you want to use this software, please contact me.

#### 如何使用 HROFFT 软件？（操作指南）

HROFFT 软件由 Kazuhiko OHKAWA 先生在 2000 年发展。该软件在 Windows 操作系统（Windows95, 98, 98SE, Me, 2000, XP）下运行。此页介绍 HROFFT 软件的操作。如果你想使用该软件，请联系我。

#### Unzip of HROFFT software

HROFFT software is zipfiles when you receive. So, please unzip this file. After you succeed unzip, you obtain three files as following images.



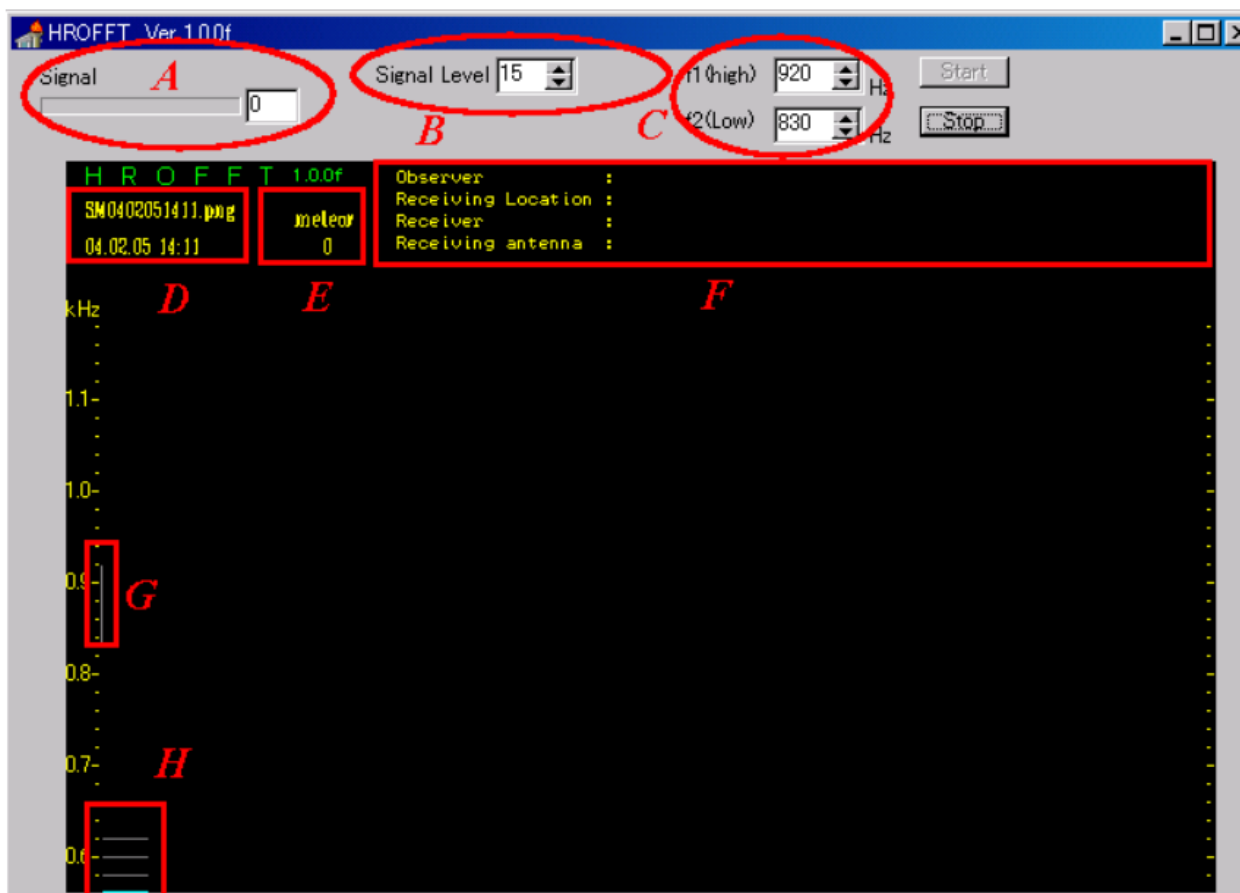
#### HROFFT 软件解压

当你接收时，HROFF 软件是 zip 文件。因此，请解压这个文件。当成功解压后，你会如下图所示获得 3 个文件。



### un HROFFT100f.exe software

Please run HROFFT100f.exe file. Then a following window appears in front of you.



#### 运行 HROFFT100f.exe 软件

运行 HROFFT100f.exe 文件，然后下面的窗口出现在你面前。

##### A : Signal

This means input sound level from receiver. Usually, this value is around 60 - 100. Please control input sound level like this sample image using volume control of receiver and PC Line-In level.

##### A : 信号

这指的是来自接收机的输入声音电平。这个值通常大约在 60-100 之间。请像这示例图使用接收机和个人电脑音频输入电平的音量控制器一样，控制输入声音的电平。

##### B : Signal Level

Maybe, you do not need to change this value. This control Signal from receiver. For example, Signal Level=15 means input sound level after the input is two times before the input. Therefore Signal Level=10 is real sound level from receiver.

##### B : 信号电平

你也许不需要改变这个值。这控制来自接收机的信号。比如，信号电平=15 意味着输入后的输入声音电平是输入前的 2 倍。因此，信号电平=10 是来自接收机的真实信号电平。



**C : f1 and f2**

You can see Intensity graph at "H" position. This intensity graph is decided by range "G" position. So, f1 and f2 means intensity graph range "G". Usually, this range is around +/- 50Hz-60Hz. (Frequency axis (vertical axis) is plotted every 20Hz (label is every 100Hz)) So, if you receive meteor echoes around 0.9kHz, f1 is 950 and f2 is 850.

**C : f1 和 f2**

你可以在“H”位置看到强度图。该强度图由“G”位置的范围决定。因此，f1 和 f2 指的是强度图范围“G”。通常这范围大约 +/-50Hz-60Hz。(频率轴 (纵轴) 每 20Hz 绘制 (每 100Hz 标记)) 所以，如果你接收的流星回波在 0.9KHz 左右，f1 是 950，f2 是 850。

**D : File Information**

First line is output file name, and second line is time. About first line, the upper image shows as "SM0402051411.png" This means "SM" is site name you can edit (using Create.txt file), and "0402051411" is this HROFFT image file is started on 14:11 5th Feb, 2004.

**D : 文件信息**

第一行是输出文件名，第二行是时间。关于第一行，上图显示为“SM0402051411.png”。“SM”是你编辑的站点名字 (使用 Header.txt 文件)， “0402051411”是该 HROFFT 图片文件始于 2004 年 2 月 5 日 14 : 11。

**E : meteor count**

This value is auto-counted meteor echoes. However, this is not sure because this value is result counted how many times signal intensity over 10dB. Therefore, I do not recommend you decided this value is equal to meteor echoes. If you would like to auto-count, please use Pierre's software.

**E : 流星计数**

该值是流星回波自动计数。但是这并不确切，因为该值是计数多少次信号强度超过 10dB 的结果。因此，我不建议你决定这个值等于流星回波。如果你想要自动计数，请使用 Pierre 的软件。

**F : Site Information**

This area shows site information such as observers name, location, equipments, etc. You can edit this information using "Header.txt".

**F : 站点信息**

该部分显示了站点信息，如：观测者名字，位置，设备等。你可以使用“Header.txt”编辑这个信息。

**G and H : signal intensity**

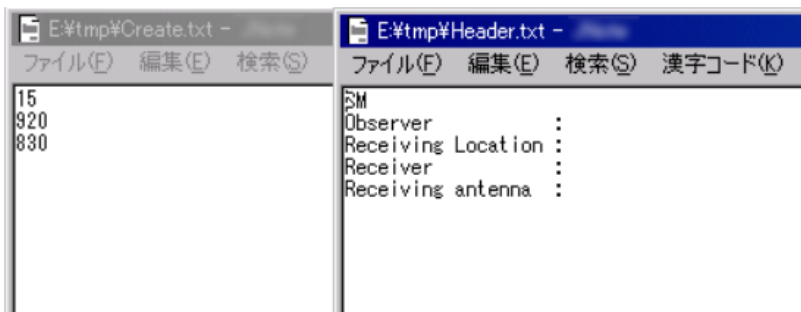
See "C" contents

**G 和 H : 信号强度**

见“C”内容

### Creat.txt and Header.txt

When you open "Creat.txt", you can see as left image. On the other hand, you open Header.txt, you can see right image.



#### Creat.txt 和 Header.txt

当你打开“Creat.txt”，你可以见到左图。另一方面，打开 Header.txt，你可以见到右图。

##### "Create.txt"

First line means "Signal Level". Second line and third line means f1 and f2. So, you can set Signal Level, f1 and f2 by using this file. Of course you can change on HROFFT software. But if you set these value using Create.txt, please set before you open HROFFT.exe file.

##### "Header.txt"

First line means site name on file name (ex. "SM" of "SM0402051411.png"). Do not delete this line. If you do not use file name, please set blank line (Don't delete). Following four sentence means site information. You can edit free.

##### "Create.txt"

第一行指的是“Signal Level”，第二行和第三行指的是 f1 和 f2。所以你可以用这个文件设置 Signal Level, f1 和 f2。当然，你可以在 HROFFT 软件上修改。但如果你用 Creat.txt 设置这些值，请在打开 HROFFT.exe 文件前设置。

##### "Header.txt"

第一行指的是文件名（例如：“SM0402051411.png”中的“SM”）上的站点名字。不要删除这一行。如果你不使用文件名，请设置空行（不要删除）。下面 4 句是站点信息。你可以免费编辑。

## 五、How to analyze

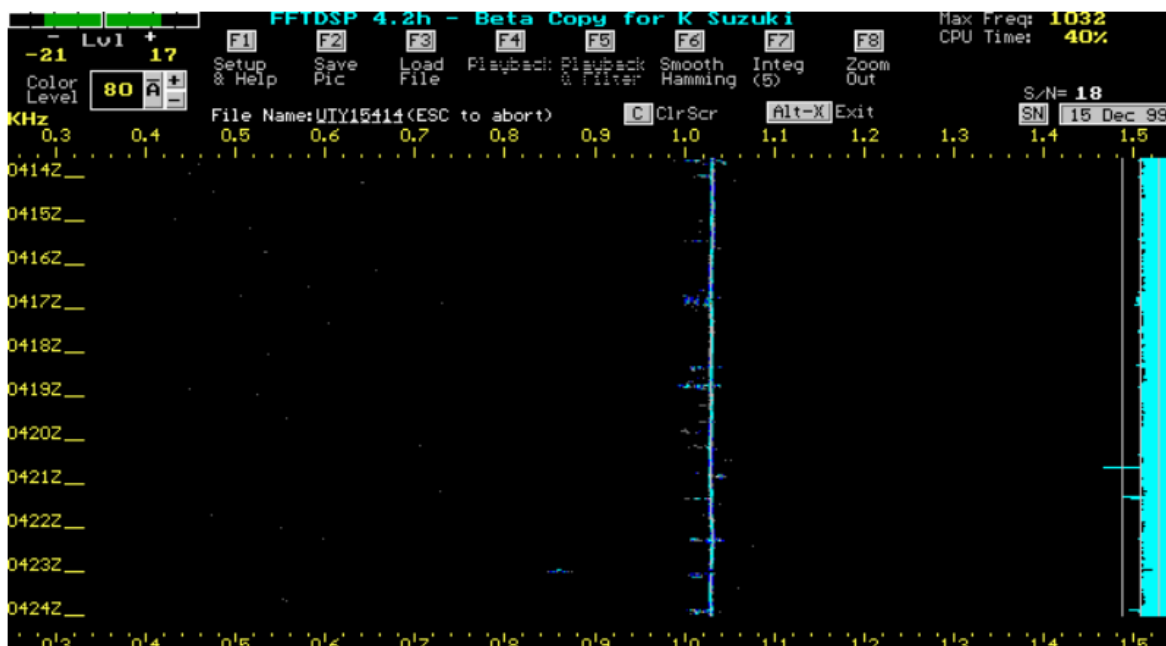
### 1、HROFFT

同“how to analyze”，略。

### 2、FFTDSP

### How to count in the case of FFTDSP4

This software was made by Cook. This software is very major soft. Date for about 10 minutes preserve as one figure. For 1 day, we can get 135 files. The file size is much smaller than HROFFT. It is about 8KB-10KB. So, the data for a day is put in a Floppy Disk. The following figure is the data by Chigusa High School. Central line is the direct wave. Because the position of Chigusa High School(the receiving set) is less than 100km from Sabae-city(the transmitting station).

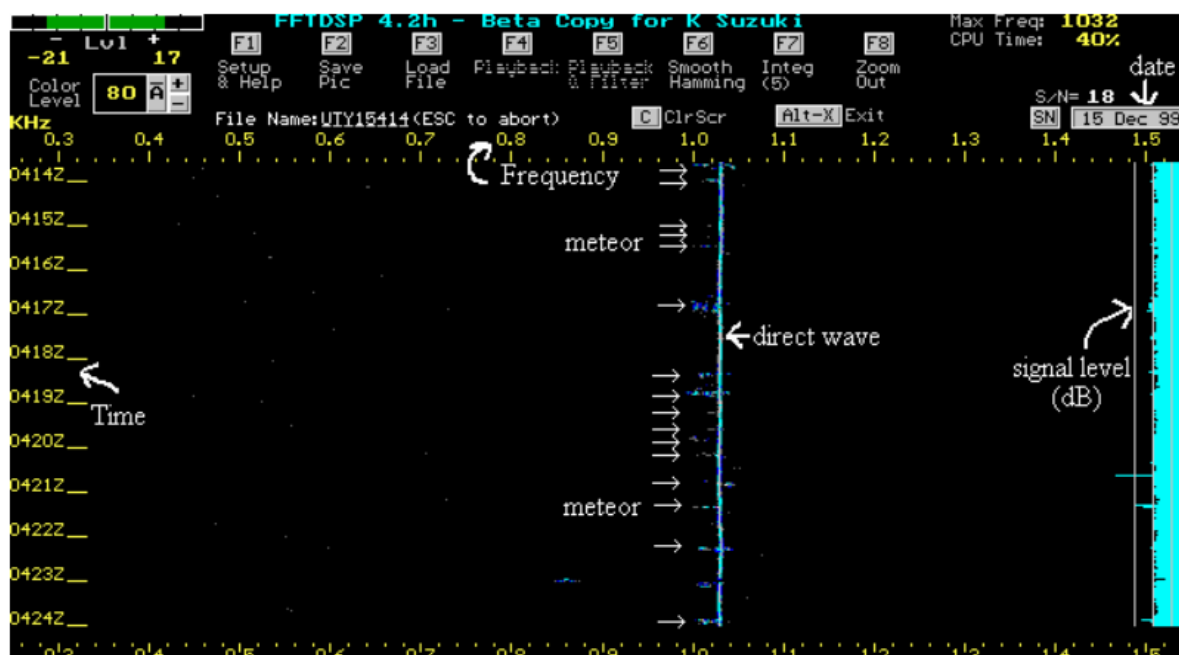


#### 就 FFTDSP 来说如何计数

该软件由 Cook 制作，是非常重要的软件。大约 10 分钟保存一张图。我们一天能得到 135 个文件。文件大小比 HROFFT 小得多大约 8KB-10KB。因此，一天的数据被放在一张软盘里。下图是千草高中的数据。中间的线是直接辐射波。因为千草高中（接收站）的位置到靖江市（发射站）少于 100km。

The file size of this figure is about 9KB.

Basically, the way of analyzing is the same of HROFFT. But the time scale is lengthwise direction. So, signal of meteor become a horizontal line. The following figure is explanation of data.



这张图的文件大小大约 9KB

分析方法基本与 HROFFT 相同。但时间尺度是纵向的。因此，流星信号成为了一条水平线。下图是数据的讲解。

#### <Attention of FFTDSP4>

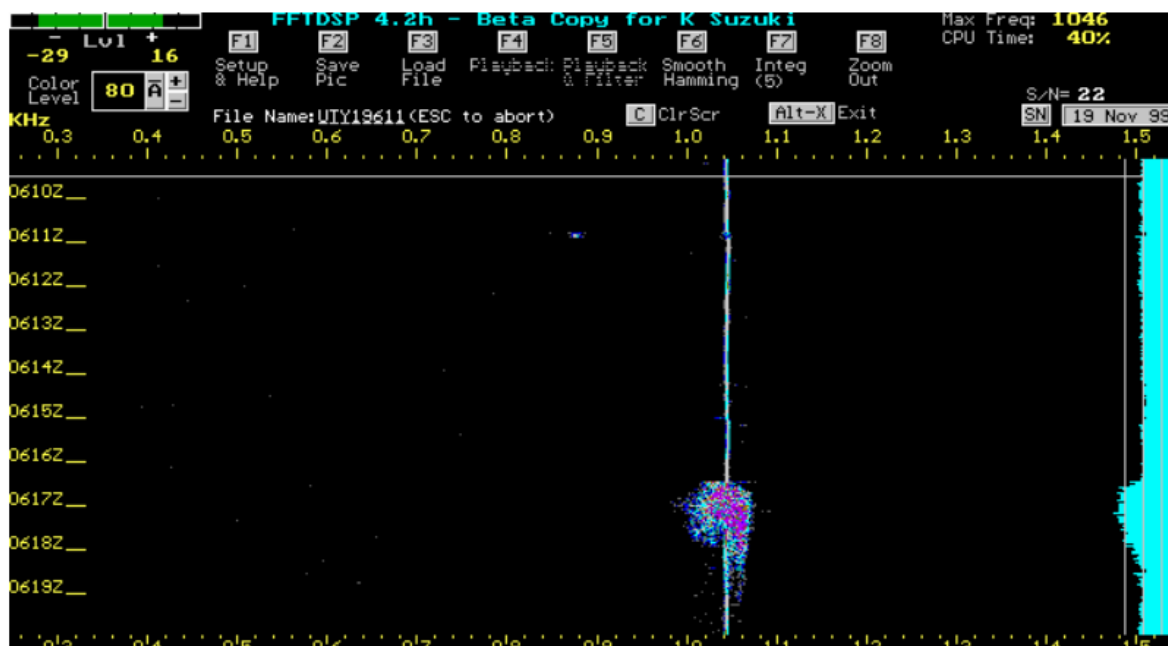
The file name is like "UT101000.gif". Don't mind "UT", please. Next "1" is month. But October, November, December do not become 10, 11, 12. So, these month signs are "y" (the miss of program ?). And next "01" is day. The final "000" is 0:00. But, from 10:00 to 23:00, 10 is "a", 11 is "b"..... and 23 is "n". For example, if the file name is "UT2223c50", this meaning is "February 23rd 12:50".

#### <FFTDSP4 注意点>

文件名如同"UT101000.gif"。请不要介意"UT"。下个"1"是月份。但 10 月，11 月，12 月没变成 10，11，12。因此，这些月份的标志是"y"（程序的失误？）。下个"01"是天数。最后的"000"是 0:00。但从 10:00 到 23:00，10 是"a"，11 是"b"..... 23 是"n"。例如，如果文件名是"UT223c50"，该意思就是"2 月 23 日 12:50"。

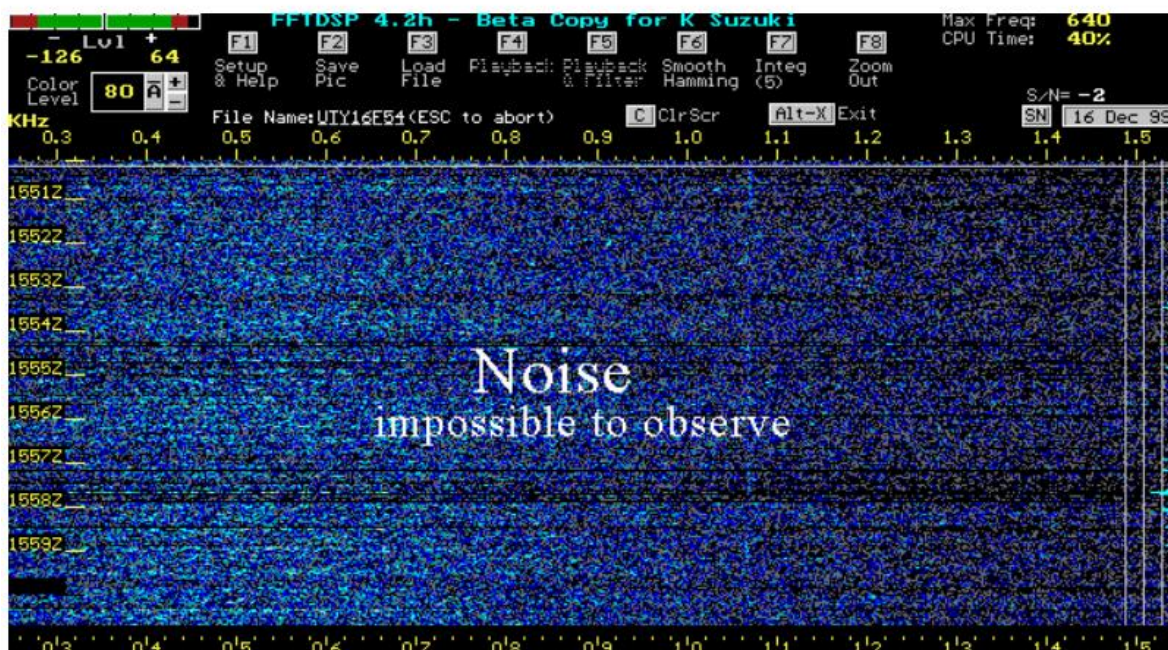


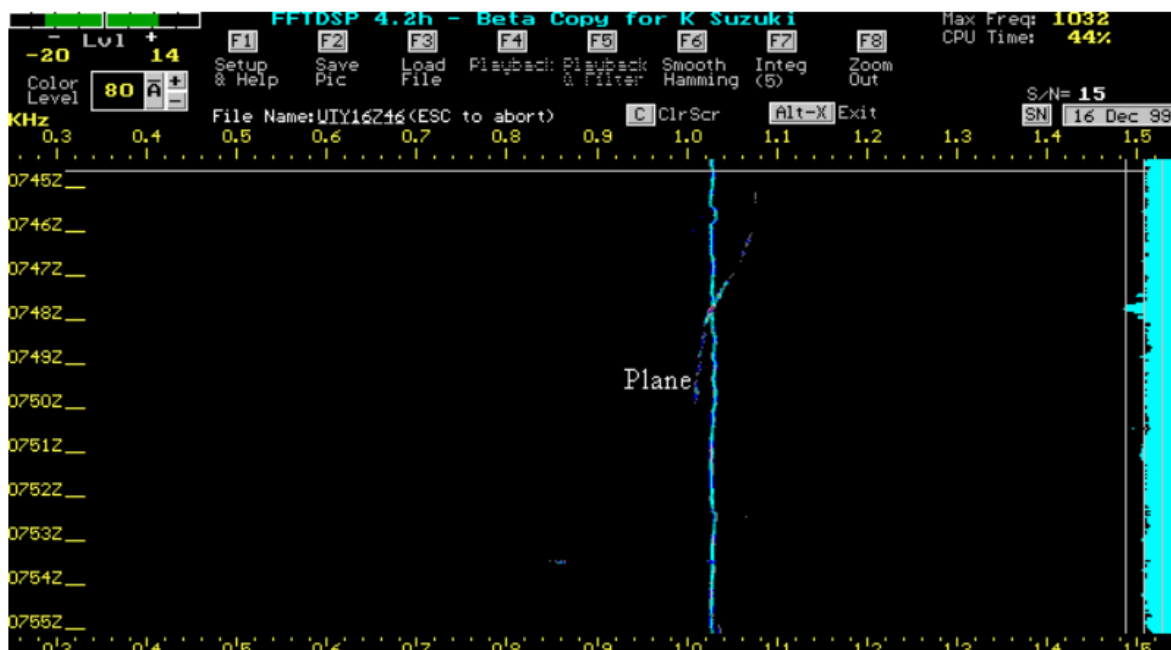
Also, the long echoes can be seen like the following figure. At Chigusa High School, echo which keeps more than 10 seconds is long echo. because of the surrounding environment of radio wave is bad.



还有，长回波会看起来像下图一样。在千草高中，持续超过 10 秒的回波是长回波，因为周围的无线电波环境不好。

In addition, when activity of the sun is active. Sporadic-E, radio noise or interference occur. When these occur, we can't observe.





另外，当太阳活动活跃时，偶发 E 层、无线电噪声或干扰出现。当这些出现时，我们不能观测。

## 六、Send to

### 1、Send your data

#### Send your report to

After you observe and counted your data, please send me your counted data. Your data make the activity of meteor shower clear. I am looking forward to.

#### 发送你的报告到

在你观测和计算数据之后，请把你的计算数据发给我。你的数据会使流星雨活动清晰。我期待着。

#### send to

Please send to the following e-mail address.

Hiroshi OGAWA (The Nippon Meteor Society)

E-mail: [info-web@amro-net.jp](mailto:info-web@amro-net.jp)

#### 发送到

请发送到下面的电子邮箱地址。

Hiroshi OGAWA (日本流星协会)

电子邮箱: [info-web@amro-net.jp](mailto:info-web@amro-net.jp)