

Initialization of the 4-m Telescope System

The common procedure, to be followed before any experiment with 4-m telescope.

1 Introduction

The 4-m SRT can be used to perform various experiments such as finding the Offsets of telescope coordinates, the Beam-Width of the telescope, detection of Galactic HI line etc. The detailed procedures for all experiments are provided in respective documents. But before actually performing any experiment, the telescope and receiver has to be initialized and the necessary procedure is described below.

Before performing the experiment, please go through the **Precautions** carefully.

2 Initialization of the Telescope and Receiver

While performing the initialization, make yourself familiar with the different parts of the system, the control softwares and different parameters.

2.1 The 4-m SRT

The telescope consists of the following subsystems as shown in the block diagram below.

1. 4-m dish mounted on a Alt-AZ mount
2. 21-cm feed mounted on the dish
3. Drives
4. Receiver
5. Control PC

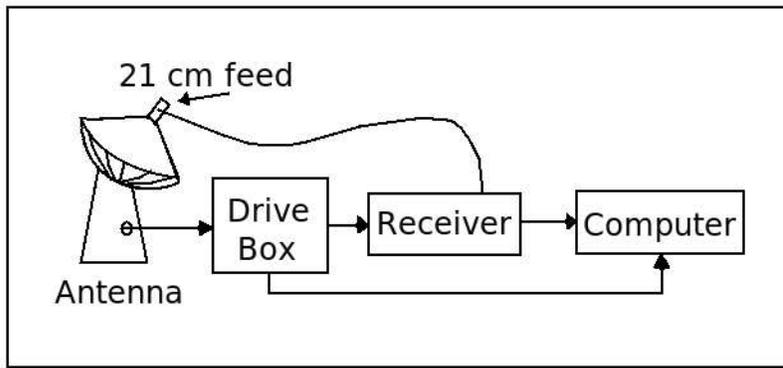


Figure 1: The block diagram of 4-m Telescope system.

2.2 Initialization of the telescope

2.2.1 Starting up

1. Switch ON the power supply to - (1) extension board, (2) PC's and (3) receiver.
2. Switch ON the mains of the drive-box and then press the GREEN button on the drive-box within 2-3 seconds.
3. Connect the drive-box to the control PC through the USB cable inside the box.

2.2.2 Telescope Homing

4. Click on the "SRT-V-35" software icon on the Desktop (open the software atleast 1 min after the drive-box is turned ON).
5. Click on "READY" and then on "MANUAL". Enter the ALT/AZ speeds as 1 deg/sec in each box.
6. Turn the antenna eastwards by 5 deg. by pressing "+" button for 5-10 sec.
7. Click on "READY" and then "HOME".
8. The home position is defined by 2 marker pulses (one for ALT and one for AZ). Wait until the telescope finds the marker pulse and stops automatically.

2.2.3 Parking the Telescope

9. After the experiment is over, park the antenna vertical position. For parking the antenna goto “READY-DESIGNATE” mode and then select the 25th mode.
10. Once the antenna is parked, goto STANDBY mode and then EXIT. Turn OFF the computer.

2.3 Initialization of receiver

2.3.1 For Continuum mode

11. In Receiver PC, start SPECTRACYBER by double clicking SPECTRACYBER icon on the desktop.
12. Select continuum mode by clicking “SETTINGS - MODE - CONTINUUM”
13. Select integration time by clicking “SETTINGS - INT - CONTINUUM - 1”
14. Select online mode by clicking “OPTIONS - ONLINE” (This will open a settings window)
15. Select the following settings for continuum mode.

Parameter	Value
IF Gain	12
DC Gain	5
DC offset	1
Time/step	1
Source name	‘name’

Go to Step 19.

2.3.2 For Spectral mode

16. In Receiver PC, start SPECTRACYBER by double clicking SPECTRACYBER icon on the desktop.
17. Select spectral mode by clicking “SETTINGS - MODE - SPECTRAL”
18. Select integration time by clicking “SETTINGS - INT - SPECTRAL”

19. Select online mode by clicking “OPTIONS - ONLINE” (This will open a settings window)
20. Select the following settings for spectral mode.

Parameter	Value
IF Gain	25
DC Gain	5
DC offset	0.5
Time/step	0.2
Upper Limit	600
Lower limit	-600
Source name	'name'

21. Start a scan by clicking “SCAN - START” (NOTE: WAIT FOR 10-15 sec. once you click on “START” for the first time, it takes 10-15 sec. for the receiver to initiate).
22. Scan can be stopped by clicking “SCAN - STOP”
23. A scan can be saved by clicking “SCAN - SAVE SCAN”. This will create a data file with start UTC time in the name, a header preceded by C and settings and list of values representing intensity.

Two data points are separated by Time/step selected (in continuum mode) or are separated by the channel band width selected (in spectral mode), which is by default set to 15kHz and can be set to 30kHz through “SETTINGS - Band Width”

The values of parameters can be adjusted as required for different experiments. This completes initialization of the telescope and receiver.

3 Precautions

1. In case, if you notice any malfunctioning of the antenna system, press the Emergency **STOP (Red Buttons)**, one provided on the antenna and the other on the drive-box for security purpose.
2. While using the antenna for the first time, if you notice the antenna motion faster than the commanded speed, press the emergency STOP button immediately and switch OFF and ON the drive-box.
3. The GREEN button on the drive-box should be pressed within 2-3 seconds once the mains of the drive-box is switched ON.
4. In case of power fail switch OFF the mains of drive-box. Switch ON the mains of drive-box and press the GREEN button on the drive-box and REDO the initialization of telescope and receiver both.
5. The receiver takes 10-15 sec. to initiate Start once you click on "START" scan for the first time, so please wait for 10-15 sec. before starting actual scans.
6. DO NOT rotate the antenna beyond the limit angles.
7. Make sure the telescope is parked in its parking position (as mentioned in **Procedure, Step-9-10**) after the experiment is over.