

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 Precautions

1. The GREEN button on the drive-box should be pressed within 2-3 seconds once the mains of the drive-box is switched ON.
2. 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.
3. 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.
4. DO NOT rotate the antenna beyond the limit angles.
5. In case, if you notice any malfunctioning of the antenna system, press the Emergency STOP (Red buttons), provided on the antenna and drive-box for security purpose.
6. Make sure the telescope is parked in its parking position (as mentioned in **Procedure, Step-9-10**) after the experiment is over.

3 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.

3.1 The 4-m SRT

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

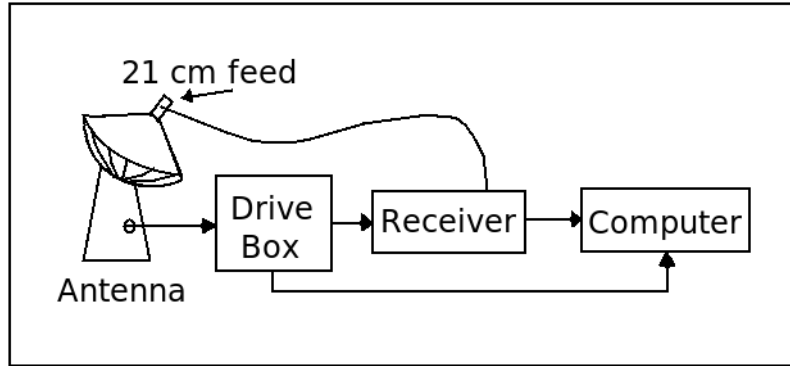


Figure 1: The block diagram of 4-m Telescope system.

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

3.2 Initialization of the telescope

3.2.1 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.

3.2.2 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 \sim by 5 deg. by pressing “+” button for ~ 5 sec. (If you notice any anomalies, Switch OFF and ON the system again.)
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.

3.2.3 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.

3.3 Initialization of receiver

3.3.1 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 settings for continuum mode as shown in the Table 1.

Two data points are separated by Time/step selected.

Go to Step 21.

3.3.2 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 settings for spectral mode as shown in the Table 1.

Parameter	Spectral mode	Continuum mode
IF Gain	25	1
DC Gain	10	5
DC offset	1.8	1.45
Time/step	0.2	0.2
Upper Limit	800	-
Lower limit	-800	-
Band width	30 kHz	-
Int. time	0.5 sec	-
Source name	‘name’	‘name’

Table 1: The parameter values for operating at different settings (Spectral or Continuum mode)

21. Select Auto Save option in “SCAN - Auto Save”, Start a scan by clicking “SCAN - START” and Stop scan by clicking “SCAN - STOP”.
(WAIT FOR 10-15 sec and then take a fresh scan again. Since, as you click on “START” for the first time, it takes 10-15 sec. for the receiver to initiate).
22. A scan can be saved by clicking “SCAN - SAVE SCAN” (IF you do not select the option of Auto Scan). The name of the data file created contain start time in UTC. The first line (preceded by C) in the file lists the values of parameters selected. Power received is stored in arbitrary units.

Two data points are separated by the single 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.