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

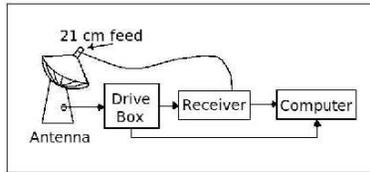2. 21-cm feed mounted on the dish

3. Drives

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

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

4. Receiver

5. Receiver Control PC

6. encoder PC/104

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 two 5-V DC power supply kept on the left hand side of encoder PC, which power the encoders of the antenna

3. Wait for 10 seconds for initialisation of encoders.

2.2.2 Parking the Telescope

After the experiment is over, park the antenna so that it is roughly pointing along the line painted on the floor.

2.3 Initialization of receiver

2.3.1 For Continuum mode

1. In Receiver PC, start SPECTRACYBER by double clicking SPEC-TRACYBER icon on the desktop.

2. Select continuum mode by clicking "SETTINGS - MODE - CONTINUUM"

Parameter	Value
IF Cont Gain	12
DC Cont Gain	1
DC Cont offset	1.2
Time/step	0.2
Source name	'Sundd-mm-yyyy-batchno'

Table 1: Receiver Settings for Continuum mode

3. Select integration time by clicking "SETTINGS - INT - CONTINUUM - 0.3"

4. Select online mode by clicking "OPTIONS - ONLINE" (This will open a settings window)

5. Select the settings for continuum mode as given in Table 2.3.1

2.3.2 For Spectral mode

1. In Receiver PC, start SPECTRACYBER by double clicking SPEC-TRACYBER icon on the desktop.

2. Select spectral mode by clicking "SETTINGS - MODE - SPECTRAL"

3. Select integration time by clicking "SETTINGS - INT - SPECTRAL - 0.3"

4. Select integration time by clicking "SETTINGS - IF BW KHZ - 30"

5. Select online mode by clicking "OPTIONS - ONLINE" (This will open a settings window)

6. Select the settings for spectral mode as given in Table 2.3.2

7. This completes initialization of the telescope and receiver.

Parameter	Value
IF Spec Gain	25
DC Spec Gain	10
DC Spec offset	1.8
Time/step	0.2
Upper Limit	600
Lower limit	-600
Source name	'S7'

Table 2: Receiver Settings for Spectral mode

2.4 Data acquisition

1. 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).

2. Scan can be stopped by clicking "SCAN - STOP"

3. A scan can be saved by clicking "SCAN - SAVE SCAN". This will create a data file with start UTC time in the name. The first line (a header preceded by C) in the file lists the settings and the remaining lines 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 30kHz through "SETTINGS - BandWidth". The values of parameters can be adjusted as required for different experiments.

3 Precautions

1. Incase, if you notice any malfunctioning of the antenna system, stop the experiment and call the RPL supervisor.

2. 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.

3. DO NOT rotate the antenna beyond the limit angles indicated by the

limit switchs. ASK the RPL supervisor about this and familiarize yourself with the limits.

4. Make sure the telescope is parked in its parking postion (as mentioned in Section 2.2.2) after the experiment is over.