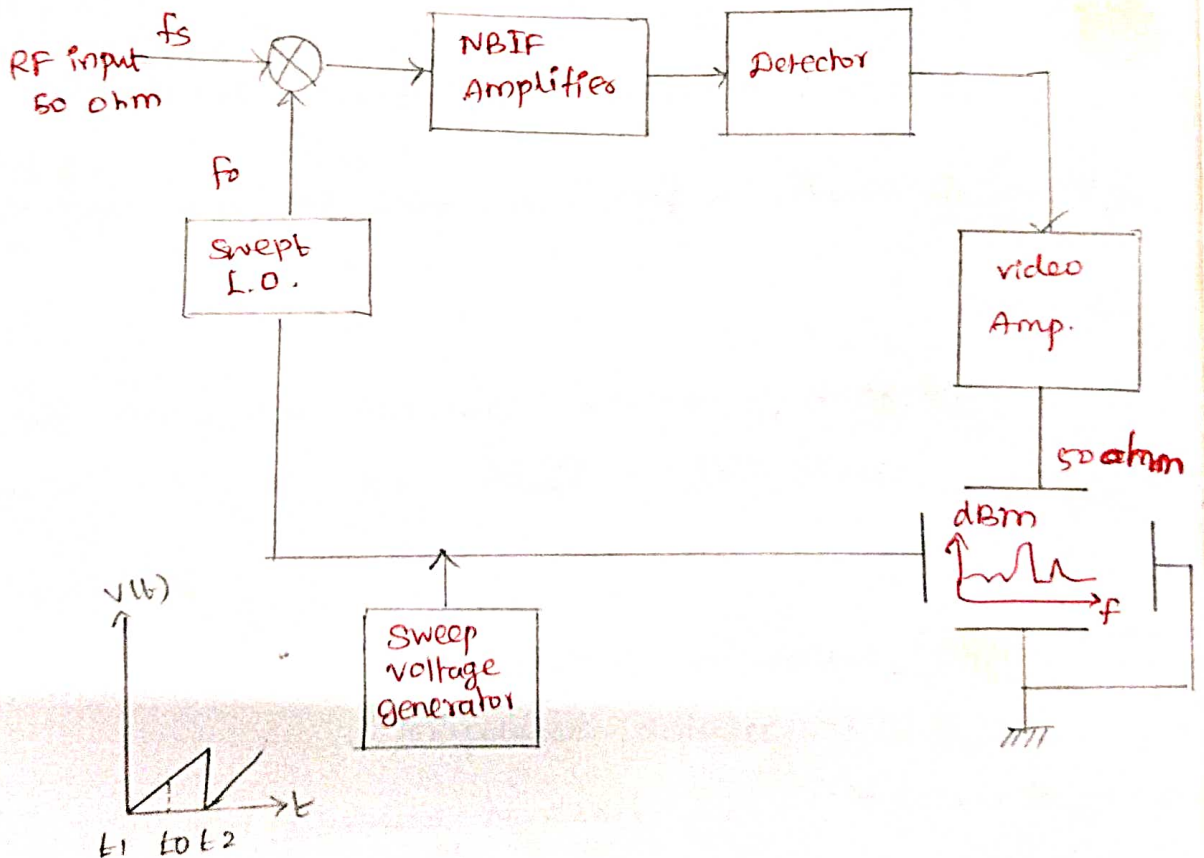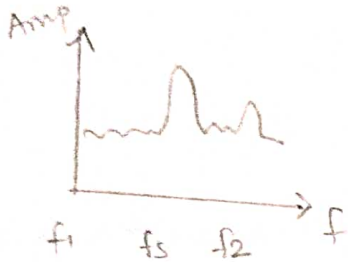# Spectrum Analyser

Aim:

To understand the working principle of power meter and its applications in microwave measurements.

objective:
To study the construction of spectrum analyser.

* spectrum analyser is a broadband super heterodyne receiver which provides a plot of amplitude versus freq. of the received signal.

Swept
-tuned type   Basic block diagram of a spectrum analyser

* Local oscillator is electronically swept back and forth b/w two freq. limits at a linear rate

* Sweep voltage - saw tooth type with zero flyback time to move the spot on CRT

* Intermediate freq.

$$f_i = f_o \pm f_{if}$$
$$f_o = f_s \pm f_{if}$$
$$\therefore f_i = f_s \pm 2 f_{if}$$

* Local Osci freq & signal freq mixed to produce freq.

diff equal to IF

$$f_{if} = f_s - f_o \; ; \quad f_s > f_o$$
$$= f_o - f_s \; ; \quad f_s < f_o$$

* These difference signals are amplified using narrowband IF amplifier

* Detector will detect signal using constant frequency

* These signals amplified using video amp → shown in display.

Applications:

* measure frequency response, noise and distortion characteristics of RF circuit (RF Mixers)

* RF oscillators

* Telecommunication — To determine occupied BW & track interference sources.

(En: Cell planners to determine interference sources in the GSM freq bands & UMTS bands)

* EMC Testing

* Wireless transmitter

* wireless receiver

* RF shielding