OPERATIONAL DESCRIPTION

TRIMBLE NAVIGATION LIMITED

TN200 NAVIGATION RECEIVER

1.0 Overview

The **Trimble Navigation Limited TN 200 Navigation Receiver (TN200)** is a Glideslope/Localizer and VOR receiver for use in general aviation. This device receives standard Glideslope/Localizer and VOR signals from aircraft mounted antennas, processes the signals to obtain bearing and elevation information, then routes these signals to user provided displays.

The **(TN200)** is divided into 3 major sections:

- Display and Control
- VOR/Localizer Receiver
- Glideslope Receiver

A block diagram showing the organization and signal flow of the **TN200** is shown in the figure. The function of the major sections is described below.

2.0 Display/Controller Assembly

The Display/Controller portion of the **TN200** provides user control of the channel settings and the output audio signal of the device. The tuning channel is set by the right hand front panel knob while the volume and power on functions are controlled by the left hand front panel knob. The selected channel is displayed on the front panel indicator. Frequently used channels can be stored and recalled using the memory function.

Once a localizer frequency is selected by the operator, this information is fed to the PLL for the Glideslope and Localizer/VOR subsystems.

3.0 VOR/Localizer Assembly

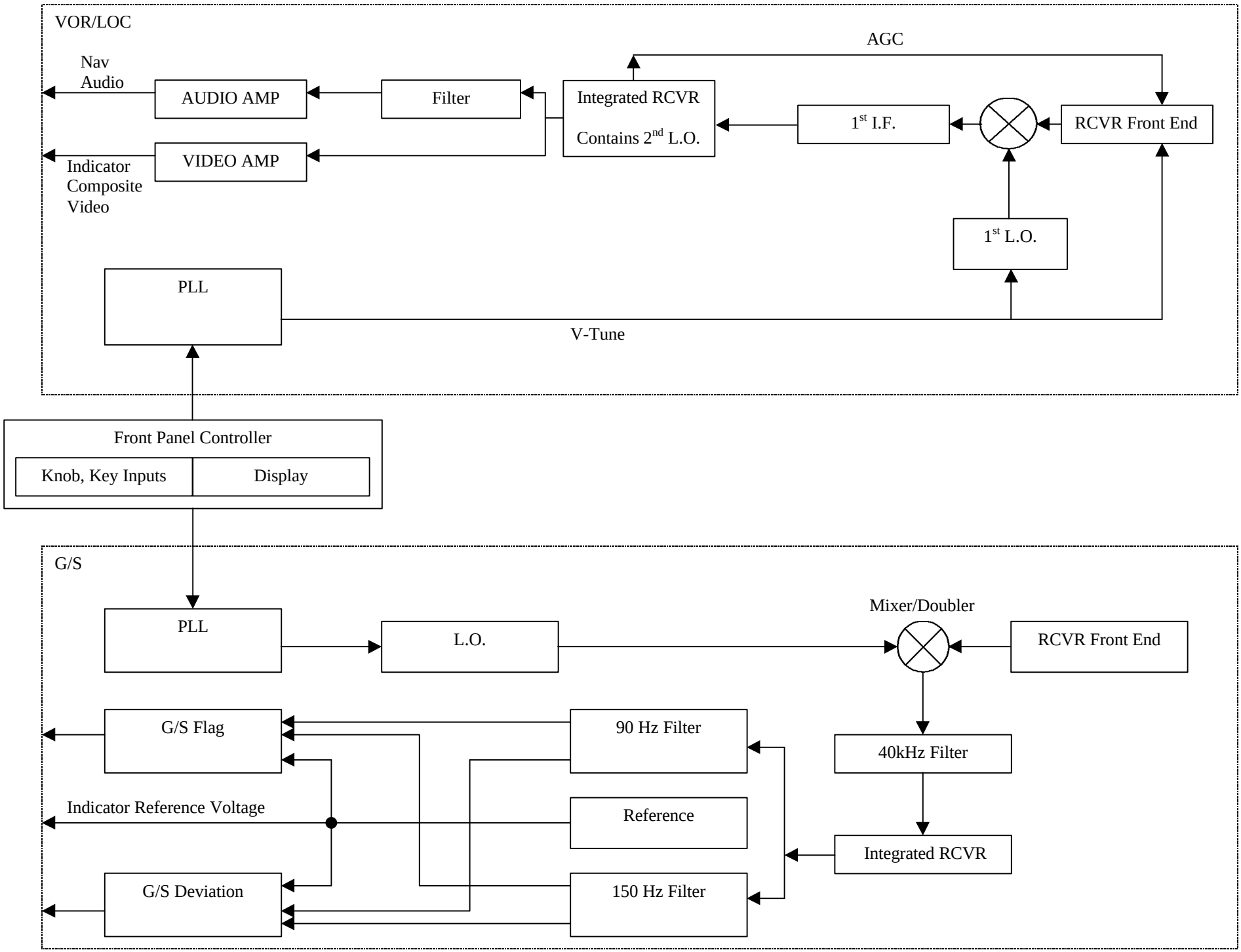
The tuning frequency for the PLL input of the VOR/Localizer Assembly is set by an input signal from the Display/Controller Assembly. This signal is fed to the first local oscillator and the VOR/Localizer receiver. The receiver signal and the LO signal are mixed then fed to the integrator circuit. The integrator circuit provides an automatic gain control signal for the receiver front end and generates the second LO signal.

The integrator provides the audio and video signals for the VOR/Localizer functions. The video signal is used to drive the Localizer portion of the Glideslope/Localizer display

while the audio is fed to the pilot headset. If the VOR option is installed, the VOR signal is fed to the appropriate display.

4.0 Glideslope Assembly

The tuning frequency for the PLL input of the VOR/Localizer Assembly is set by an input signal from the Display/Controller Assembly. This signal is fed to the first local oscillator and is mixed with the signal received from the Glideslope antenna. The mixed signal is then filtered and integrated to provide a baseband signal. The basedband signal is then filtered to obtain the 90 and 150 Hz glideslope tone levels. The Glideslope Deviation Module determines the amount and direction of deflection for the glideslope indicator while the Glideslope Flag Indicator Module determines if the out of bounds flags should be set. Both modules provide signal levels compliant with industry and FAA standards for Glideslope display protocols.


VOR/LOC
AGC
Nav
Audio
AUDIO AMP
Filter
Integrated RCVR
Contains 2nd L.O.
1st I.F.
RCVR Front End
Indicator
Composite
Video
VIDEO AMP
1st L.O.
PLL
V-Tune
Front Panel Controller
Knob, Key Inputs
Display
G/S
PLL
L.O.
Mixer/Doubler
RCVR Front End
G/S Flag
90 Hz Filter
40kHz Filter
Indicator Reference Voltage
Reference
Integrated RCVR
G/S Deviation
150 Hz Filter