CIRCUIT DESCRIPTION

● FM TUNER SECTION

The signal which has entered through the antenna is high-frequency amplified in the front end unit FE101, mixed with the output of the local oscillator and converted into the 10.7MHz intermediate frequency.
The 10.7MHz signal is amplified in the intermediate frequency amplifying section which consists of CF201, Q201, Q202, CF202, Q203, Q204 and CF203 and fed to 1 pin of IC201. In IC201, the signal is transmitted through the IF amplifier in six steps, detected in the quadrature and after going through the AF amplifier it is output from 6 pin.
Then it is fed through Q309 to 2 pin of IC301. In IC301, the pilot signal is detected out of the signal which has been fed and 38kHz signal is produsd. The stereo signal is demodulated by that 38kHz signal and output from 4 pin for the left channel and from 7 pin for the right channel to be fed to the amplifier.

● ACTIVE TRACKING CIRCUIT

To reduce interferance from strong FM stations, the Hi Q mode can be selected. In the Hi Q mode, the 10.7MHz IF signal from the emittor of Q203 is emittor-coupled into Q205. This signal then panes through CF204, Q207 and CF205 into pin 1 of IC202. In IC202, the phase of this signal is compaired with the phase of the VCO signal generated by Q206, varicap diode D203 and L203.
The phase comparison is made between pin 1 and pin 9 of IC202. The output of the phase comparitor (pin 7 of IC202) is again fed to the base of the external LPF transistor Q210.
The phase compaired 10.7MHz signal at L203 is fed into pin 1 of IC201 through C238, D202 and C208.
When the FINE TUNE front panel control setting is changed, the DC bias voltage of varicap diode D203 changes and the center frequency of the Q206 VCO is varied. By means of this system, interference from other FM stations can be reduced or eliminated.

● AM TUNER SECTION

The signal which has entered through the antenna is transmitted through the tuning circuit consisting of L251 and TC251, also through Q251 and fed to 3 pin of IC251. In IC251, it undergoes high-frequency amplification, local oscillation, mixing, intermediate frequency amplification and detection, and then output from 13 pin. This signal is turned ON and OFF at Q252 according to the signal from the input selector and fed through Q309 to IC301.

● MUTING CIRCUIT

If FM is received out of tuning or in a very weak field intensity, 12 pin of IC201 becomes high level. Then this is supplied to the base of Q11 through NOR GATE IC354, whereby Q11 and Q10 turn ON. As a result, Q305 (L ch) and Q306 (R ch) also turn ON to mute the output.

● TUNING KNOB CIRCUIT

When the tuning knob is turned, the disc with black and white stripe pattern turns as they are interlocked. Then the signal is fed through each of the active type photo-sensors (PH801 for UP, PH802 for DOWN) as a pulse signal to the turning direction detecting circuit consisting of IC801, IC802 and IC803. When the tuning knob is turned UP, the signal is fed through Q813 to 9 pin of the digital tuning IC, IC702, which thereby starts scanning in the UP direction. When tuned DOWN, the signal is fed through Q814 to 10 pin of IC702 to start scanning in the DOWN direction.

● SYNTHESIZER SECTION

• FM

The local oscillation output is fed from the front end unit FE101 to 5 pin of the prescaler: IC701 and after being frequency divided into 30 or 32, it is fed to 37 pin of the PLL synthesizer IC702. In IC702, the standard frequency is oscillated by the crystal oscillator, compared with the divided local oscillation output signal and output to 35 pin.
This voltage is level converted at Q701, Q702 and Q703, and fed to the varicap diode in the front end unit.

• AM

The local oscillation output signal is fed from 20 pin of IC251 to 39 pin of the PLL synthesizer IC702. In IC702, the standard frequency is oscillated by the crystal oscillator, compared with the local oscillation output signal and output to 35 pin.

● INDICATOR SECTION

• Frequency display

The serial data sent out of 27 pin of the PLL synthesizer IC702 is fed to 2 pin of the frequency indicating driver IC751, where the data is decoded to provide a signal which turns ON the indicator.

• Signal strength

The voltage corresponding to the signal level is output from 13 pin of IC201 (for FM) and 16 pin of IC251 (for AM), transmitted through the buffer amplifier IC351 and fed to 8 pin of the level comparator IC352. Then it is further sent through Exclusive OR IC753 and IC754 to the indicator, whereby the signal strength segments 1 to 5 light according to the signal level.

• Tuning

When tuning, the output of 7 pin of IC202 is fed to the comparator IC353 where operation is identified among tuning, + scan and − scan. The output is sent through Exclusive OR IC754 and IC755 to the indicator, whereby the fine tuning segment of the indicator lights according to the tuning direction.

BLOCK DIAGRAM