

# CFD-515

## SERVICE MANUAL

US Model  
Canadian Model  
UK Model



### AUDIO POWER SPECIFICATIONS

#### POWER OUTPUT AND TOTAL HARMONIC DISTORTION

With 3.2-ohm loads, both channel driven from 150 - 10,000 Hz; rated 2 W per channel-minimum RMS power, with no more than 10 % total harmonic distortion in AC operation.

CD Section	Model Name Using Similar Mechanism	CFD-550
	CD Mechanism Type	KSM-213BAN
	Optical Pick-Up Name	KSS-213B
TAPE Section	Model Name Using Similar Mechanism	CFS-208
	Tape Transport Mechanism Type	MF-311

### SPECIFICATIONS

#### CD player section

##### System

Compact disc digital audio system

##### Laser diode properties

Material: GaAlAs

Wave length: 780 nm

Emission duration: Continuous

Laser output: Less than 44.6  $\mu$ W

(This output is the value measured at a distance of about 200 mm from the objective lens surface on the optical pick-up block with 7 mm aperture.)

##### Spindle speed

200 r/min (rpm) to 500 r/min (rpm) (CLV)

##### Number of channels

2

##### Frequency response

20-20,000 Hz  $\pm$ 1/-2 dB

##### Wow and flutter

Below measurable limit

#### Radio section

##### Frequency range

FM: 87.6-108 MHz (US, Canadian)

87.6-107 MHz (UK)

AM: 530-1,710 kHz (US, Canadian)

531-1,602 kHz (UK)

#### Aerials

FM: Telescopic aerial

AM: Built-in ferrite bar aerial

#### Cassette-corder section

##### Recording system

4-track 2 channel stereo

##### Fast winding time

Approx. 115 s (sec.) with Sony cassette C-60

##### Frequency response

TYPE I (normal): 70-10,000 Hz

#### General

##### Speaker

Full range: 10 cm dia., 3.2 ohms, cone type (2)

Tweeter: 2 cm (2)

##### Outputs

Headphones jack (stereo minijack)

For 16-68 ohms impedance headphones

##### Maximum power output

2.3 W + 2.3 W

##### Power requirements

120 V AC, 60 Hz (US, Canadian)

230-240 V AC, 50 Hz (UK)

9 V DC, 6 R20 (size D) batteries

##### Power consumption

AC 20 W

#### Battery life

##### FM recording

Sony R20P: approx. 13.5 h

Sony alkaline LR20: approx. 19 h

##### Tape playback

Sony R20P: approx. 7.5 h

Sony alkaline LR20: approx. 12 h

##### CD playback

Sony R20P: approx. 2.5 h

Sony alkaline LR20: approx. 4.5 h

#### Dimensions

Approx. 520x253x256 mm (w/h/d)

(20 1/2 x 10 x 10 1/8 inches) (incl. projecting parts)

#### Mass

Approx. 5.8 kg (12 lb. 13 oz) (incl. batteries)

#### Supplied accessory

AC power cord (1)

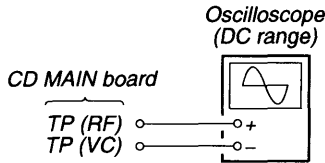
Design and specifications are subject to change without notice.

CD RADIO CASSETTE-CORDER  
**SONY**<sup>®</sup>

## Focus Bias Adjustment

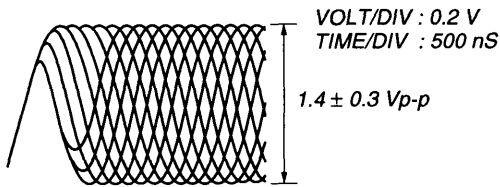
This adjustment is to be done when the optical pick-up block is replaced.

### Procedure:



1. Put the set into test mode.
2. Connect oscilloscope between TP (RF) and TP (VC).
3. Press ►► and ◀◀ buttons to move the optical pick-up to the center. (Move the optical pick-up to the music area on the disc to enable easy visibility of the eye pattern.)
4. Insert disc (YEDS-18) in and press ►► button.
5. Press the ►► button. (Tracking Servo ON)
6. Adjust RV701 so that the oscilloscope waveform is as shown in the figure below. (eye pattern)  
A good eye pattern means that the diamond shape (◇) in the center of the waveform can be clearly distinguished.
7. Release test mode after adjustment is completed.

### • RF signal reference waveform (eye pattern)



When observing the eye pattern, set the oscilloscope for AC range and raise vertical sensitivity.

**Adjustment Location:** CD MAIN board (See page 24.)

## REFERENCE

### Focus/Tracking Gain Adjustment

A frequency response analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow-up (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

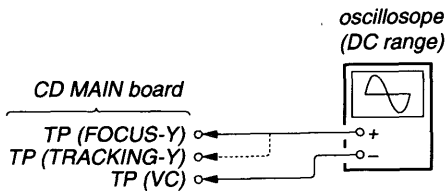
- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

Symptoms	Gain	Focus	Tracking
• The time until music starts becomes longer for ■→►► on automatic selection. (◀◀, ►► buttons pressed.) (Normally takes about 2 seconds.)		low	low or high
• Music does not start and disc continues to rotate for ■→►► or automatic selection. (◀◀, ►► buttons pressed.)		-	low
• Sound is interrupted during PLAY. Or time counter display stops progressing.		-	low
• More noise during 2-axis device operation.		high	high

The following is a simple adjustment method.

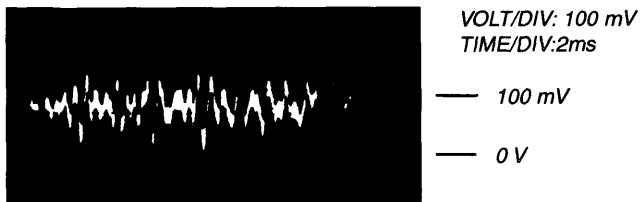
**– Simple Adjustment –**

**Note:** Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the positions after the primary adjustment are only a little different, return the controls to the original position.

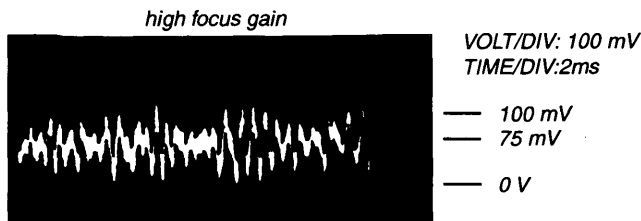
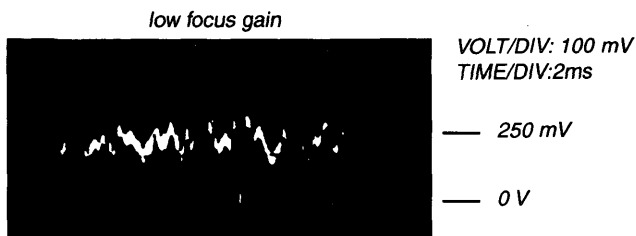


**Procedure:**

1. Keep the set horizontal.  
If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2-axis device.
2. Put the set into test mode.
3. Connect oscilloscope to TP (FOCUS-Y) and TP (VC).
4. Insert disc (YEDS-18) in and press ►|| button.
5. Press the ►|| button. (Tracking Servo ON)
6. Adjust RV702 so that the waveform is as shown in the figure below. (Focus gain adjustment)



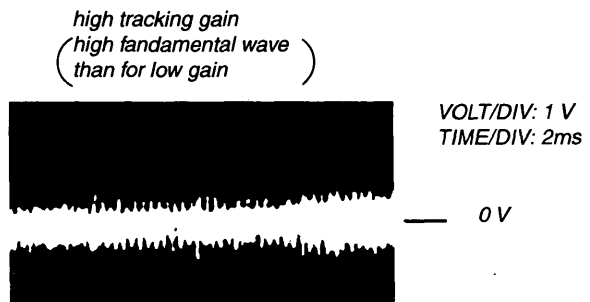
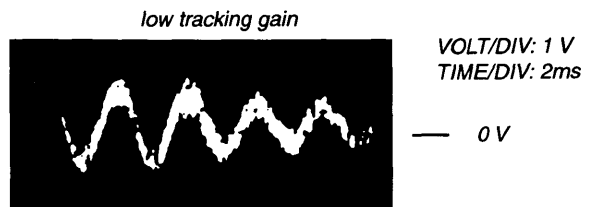
- Inconnect Examples (DC level changes more than on adjusted waveform)



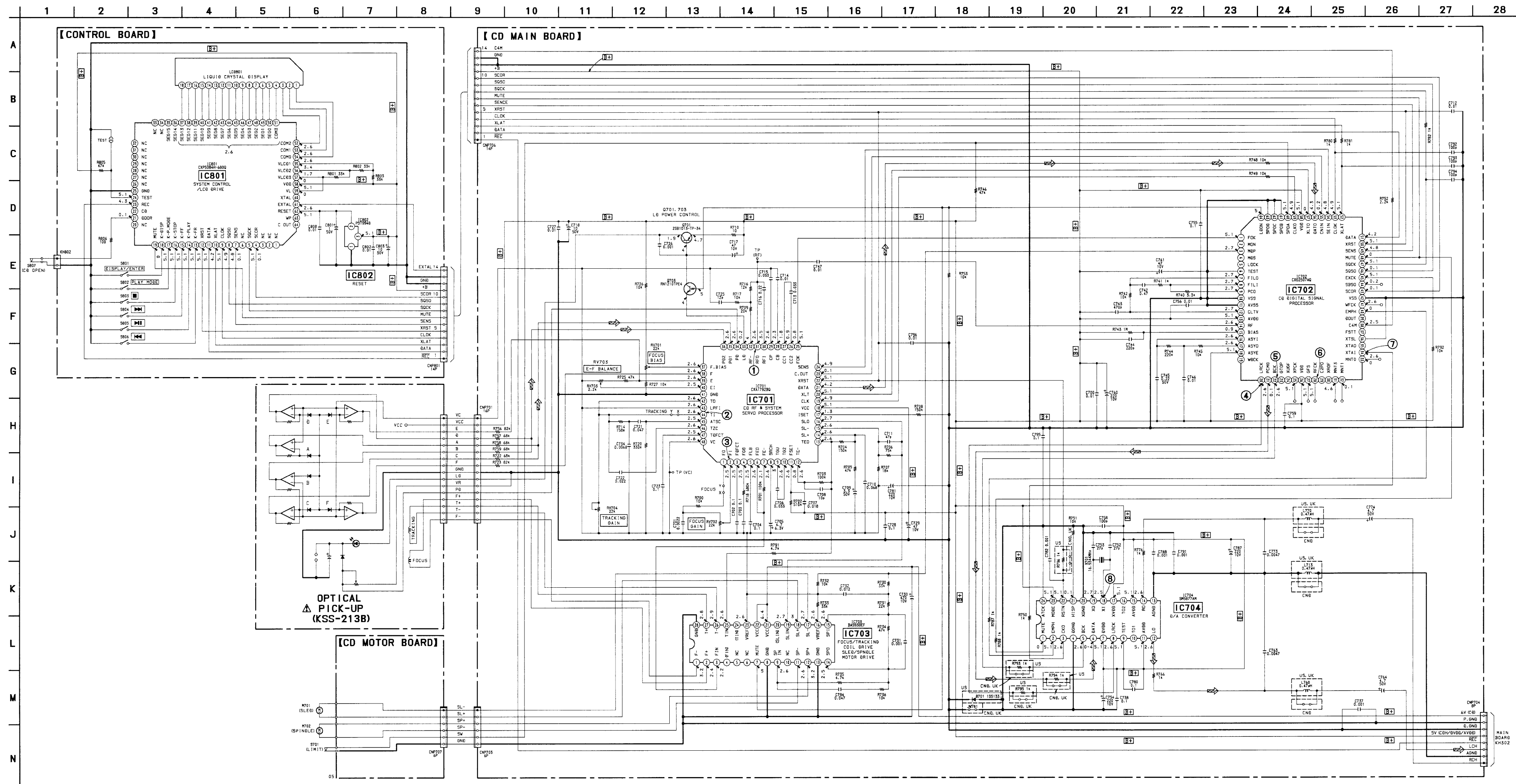
7. Connect oscilloscope to TP (TRACKING-Y) and TP (VC).
8. Adjust RV704 so that the waveform is as shown in the figure below. (tracking gain adjustment)
9. Release test mode after adjustment is completed.



- Incorrect Examples (fundamental wave appears)



• See page 38 for IC Block Diagrams.



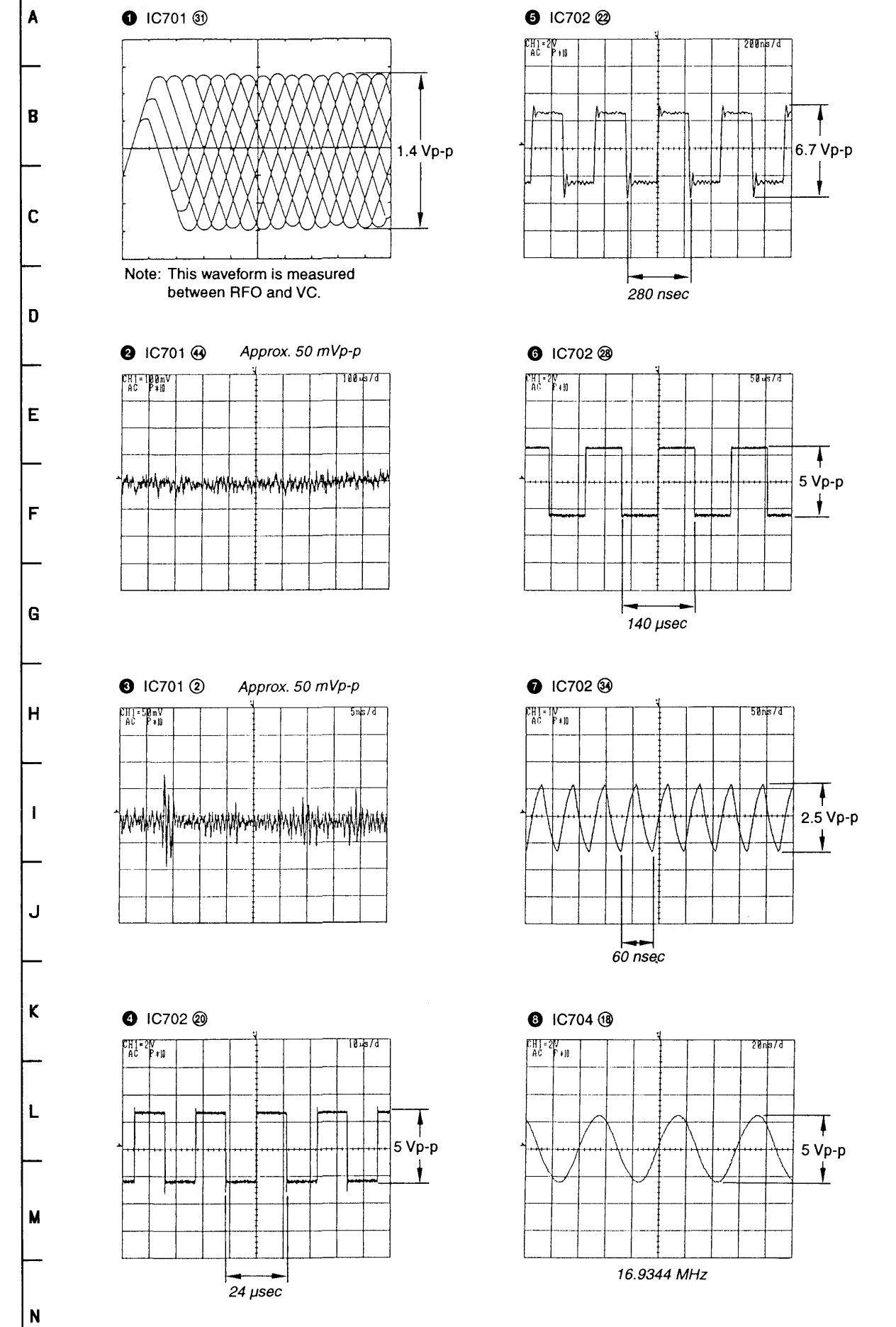
**Note on Schematic Diagram:**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{pF}$  50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/4\text{ W}$  or less unless otherwise specified.

<p><b>Note:</b> The components identified by mark <math>\Delta</math> or dotted line with mark <math>\Delta</math> are critical for safety. Replace only with part number specified.</p>	<p><b>Note:</b> Les composants identifiés par une marque <math>\Delta</math> sont critiques pour la sécurité. ne les remplacer que par une pièce portant le numéro spécifié.</p>
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- **B+** : B+ Line.
- **□** : panel designation.
- **▭** : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance 10  $\text{M}\Omega$ ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- **⇒** : CD
- Abbreviation  
CND: Canadian

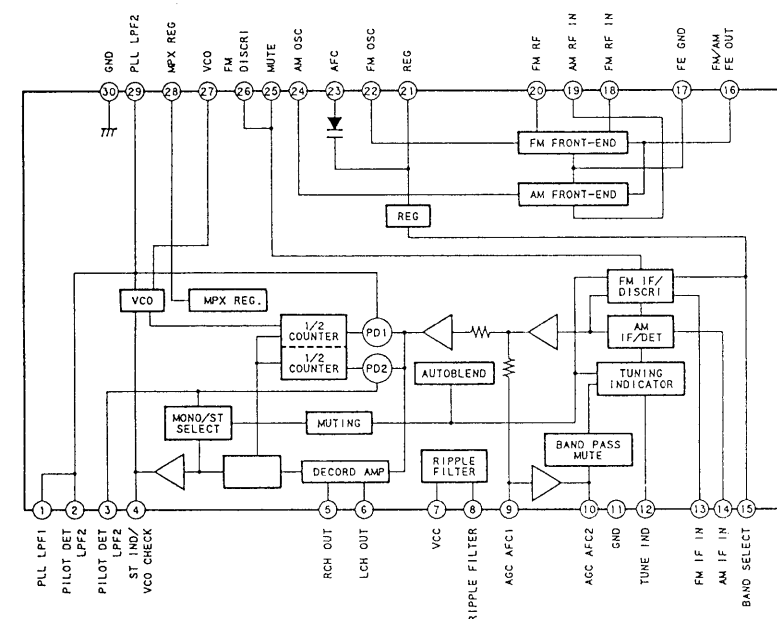
• Waveforms



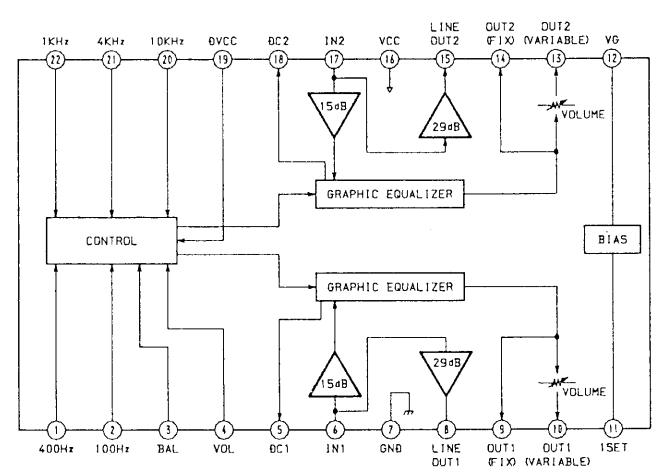
6-3. SCHEMATIC DIAGRAM - AUDIO Section -

• IC Block Diagrams

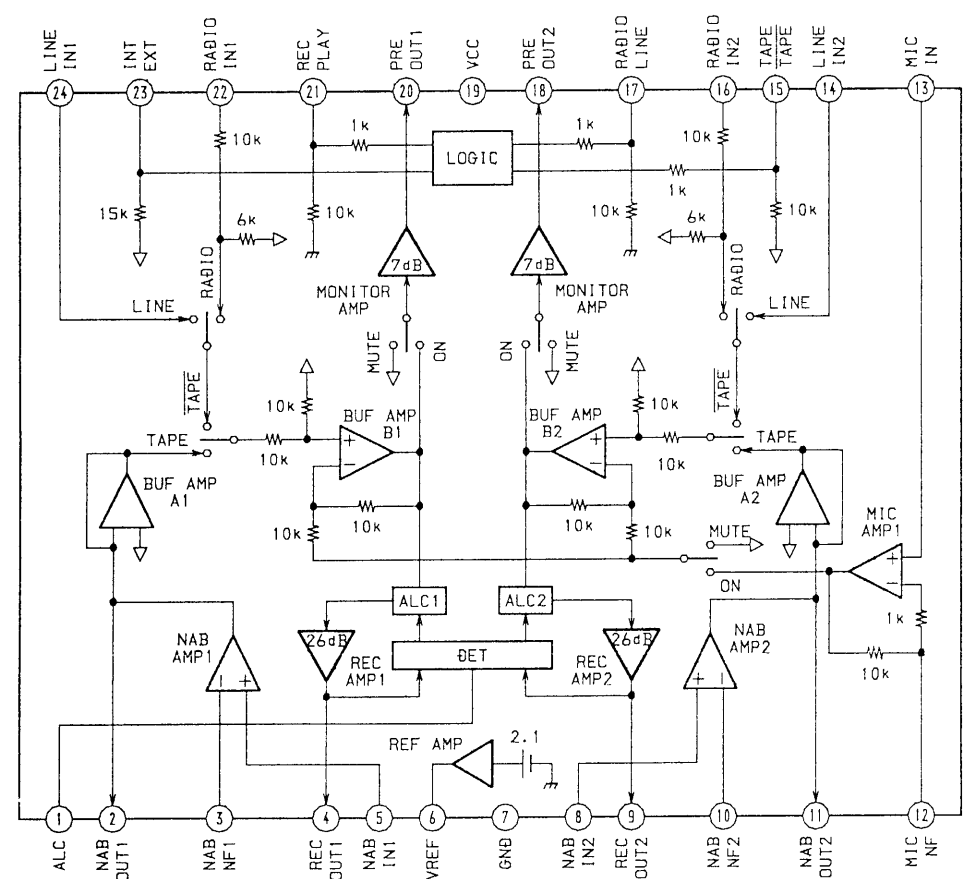
IC1 CXA1238S



IC303 CXA1352AS



IC301 TA2068N



Note on Schematic Diagram:

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- All resistors are in  $\Omega$  and  $1/4\text{W}$  or less unless otherwise specified.
- $\Delta$  : internal component.
- $\square$  : nonflammable resistor.

**Note:**  
The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

**Note:**  
Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité. ne les remplacer que par une pièce portant le numéro spécifié.

- **B+** : B+ Line.
- $\square$  : panel designation.
- $\square$  : adjustment for repair.
- Voltages are dc with respect to ground under no-signal (detuned) conditions.
- no mark : FM
- ( ) : AM
- [ ] : CD
- < > : Play back
- << >> : Record
- Voltages are taken with a VOM (input impedance 10 M $\Omega$ ). Voltage variations may be noted due to normal production tolerances.
- Voltage variations may be noted due to normal production tolerances.
- Signal path.
- $\nabla$  : FM
- $\nabla$  : PB
- $\nabla$  : REC
- $\nabla$  : CD
- Abbreviation
- CND: Canadian

