



MULTI-CD CONTROL FM/MW/LW TUNER DECK AMPLIFIER

KEH-P5200RDS EW

KEH-P5100RDS EW

KEH-P4200RDS EW

KEH-P4100RDS EW

KEH-P24RDS EW

KEH-P14RDS EW

FM/MW/LW TUNER DECK AMPLIFIER

KEH-3900RDS EW

KEH-3800RDS EW

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KEH-P5200RDS, P5100RDS, P4200RDS, P4100RDS, KEH-P24RDS, P14RDS, 3900RDS, 3800RDS

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1. SPECIFICATIONS

General

Power source..... 14.4 V DC (10.8 — 15.6 V allowable)
 Grounding system..... Negative type
 Max. current consumption..... 8.5 A
 Dimensions (chassis)..... 178 (W) × 50 (H) × 150 (D) mm
 (front face)..... 188 (W) × 58 (H) × 19 (D) mm
 Weight..... 1.3 kg

Amplifier

Maximum power output..... 35 W × 4 (EIAJ)
 Continuous power output..... 22 W × 4 (DIN45324, -B = 14.4 V)
 Load impedance..... 4 Ω (4 — 8 Ω allowable)
 Preout output level/output impedance..... 500 mV/1 kΩ
 Tone controls (bass)..... ±10 dB (100 Hz)
 (treble)..... ±10 dB (10 kHz)
 Loudness contour..... +10 dB (100 Hz), +7 dB (10 kHz)
 (Volume: -30 dB)

Tape player

Tape..... Compact cassette tape (C-30 — C-90)
 Tape speed..... 4.76 cm/sec. (+0.14 cm/sec., -0.05 cm/sec.)
 Fast forward/rewind time..... Approx. 100 sec. for C-60
 Wow & flutter..... 0.13 % (WRMS)
 Frequency response
 (KEH-P5200RDS, P5100RDS) ... Metal: 40 — 17,000 Hz (±3 dB)
 (KEH-P4200RDS, P4100RDS, P24RDS, P14RDS, 3900RDS,
 3800RDS) :40 — 14,000 Hz (±3 dB)
 Stereo separation..... 45 dB
 Signal-to-noise ratio
 (KEH-P5200RDS, P5100RDS)
 Metal: Dolby B NR IN: 63 dB (IEC-A network)
 Dolby NR OUT: 55 dB (IEC-A network)
 (KEH-P4200RDS, P4100RDS, P24RDS, P14RDS, 3900RDS,
 3800RDS) 52 dB (IEC-A network)

FM tuner

Frequency range..... 87.5 — 108 MHz
 Usable sensitivity..... 11 dBf (1.0 μV/75 Ω, mono, S/N: 30 dB)
 50 dB quieting sensitivity..... 16 dBf (1.7 μV/75 Ω, mono)
 Signal-to-noise ratio..... 70 dB (IEC-A network)
 Distortion..... 0.3 % (at 65 dBf, 1 kHz, stereo)
 Frequency response..... 30 — 15,000 Hz (±3 dB)
 Stereo separation..... 40 dB (at 65 dBf, 1 kHz)

MW tuner

Frequency range..... 531 — 1,602 kHz
 Usable sensitivity..... 18 μV (25 dB) (S/N: 20 dB)
 Selectivity..... 50 dB (±9 kHz)

LW tuner

Frequency range..... 153 — 281 kHz
 Usable sensitivity..... 30 μV (30 dB) (S/N: 20 dB)
 Selectivity..... 50 dB (±9 kHz)

Note:

Specifications and the design are subject to possible modification without notice due to improvements.

2. OPERATION AND CONNECTION

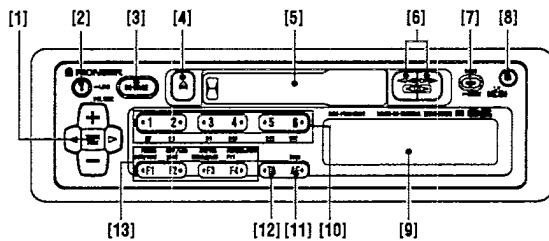


Fig. 1

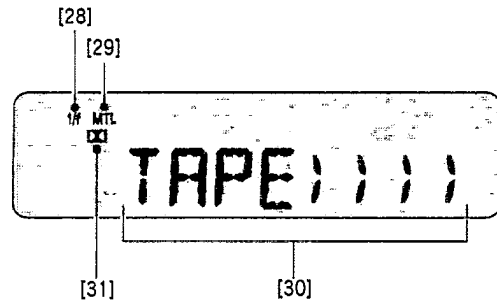


Fig. 3

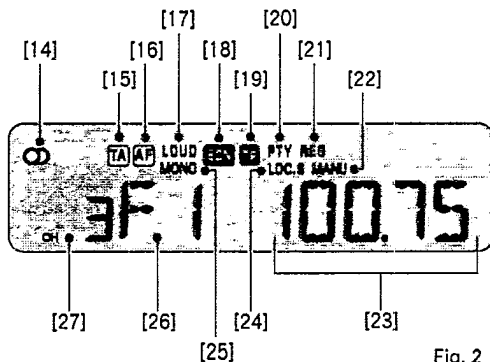


Fig. 2

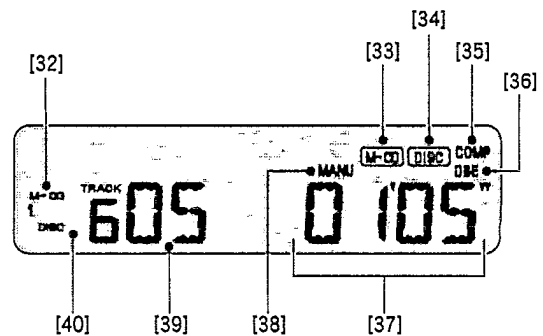


Fig. 4

KEH-P520ORDS, P510ORDS, P420ORDS, P410ORDS, KEH-P24RDS, P14RDS, 3900ORDS, 3800ORDS

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Connecting the Units

Note:

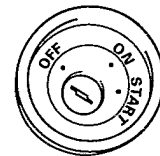
- This unit is for vehicles with a 12-volt battery and negative grounding. Before installing it in a recreational vehicle, truck, or bus, check the battery voltage.
- To avoid shorts in the electrical system, be sure to disconnect the battery ⊖ cable before beginning installation.
- Check whether installation and wiring have been completed correctly. Replace the removed car components, then connect the end of the cable to the negative ⊖ terminal of the battery.
- Refer to the owner's manual for details on connecting the various cords of the power amp and other units, then make connections correctly.
- Secure the wiring with cable clamps or adhesive tape. To protect the wiring, wrap adhesive tape around them where they lie against metal parts.
- Route and secure all wiring so it cannot touch any moving parts, such as the gear shift, handbrake, and seat rails. Do not route wiring in places that get hot, such as near the heater outlet. If the insulation of the wiring melts or gets torn, there is a danger of the wiring short-circuiting to the vehicle body.
- Don't pass the orange lead through a hole into the engine compartment to connect to the battery. This will damage the lead insulation and can cause a very dangerous short.

- Do not shorten any leads. If you do, the protection circuit may fail to work when it should.
- Never feed power to other equipment by cutting the insulation of the power supply lead of the unit and tapping into the lead. The current capacity of the lead will be exceeded, causing over heating.
- When replacing fuse, be sure to use only fuse of the rating prescribed on the fuse holder.
- Since a unique BPTL circuit is employed, never wire so the speaker leads are directly grounded or the left and right speaker ⊖ leads are common.
- Speakers connected to this unit must be high-power types possessing minimum rating of 35 W and impedance of 4 to 8 ohms. Connecting speakers with output and/or impedance values other than those noted here can damage the speakers.
- When connecting a power amp, never connect the blue lead to the amp's power supply terminal. Also, when connecting an auto antenna, never connect the blue lead to the antenna's power supply terminal. Such connections may cause damage due to excessive current.
- To prevent incorrect connection, the input side of the IP-BUS connector is blue, and the output side is black. Connect the connectors of the same colors correctly.

- When the unit is mounted in a vehicle whose ignition switch does not have the ACC (accessory) position as shown in Fig. 6, be sure to connect the red lead of the unit to the terminal controlled by the ignition switch ON/OFF position. If you do not, the vehicle battery may go flat when you leave your vehicle for several hours.



ACC position



No ACC position

Fig. 5

Fig. 6

Connection Diagram (Fig. 7)

1. Antenna jack
2. Rear out
3. White
4. Red
5. Connecting cords with RCA pin plugs (sold separately)
6. Power amp (sold separately)
7. Blue
8. CD player (sold separately)
9. Multi-play CD player (sold separately)
10. Please make correct connections according to the directions in the Multi-play CD player's owner's manual.
11. IP-BUS input (blue)
12. Blue
To system control terminal of the power amp or Auto-antenna relay control terminal (Max. 300 mA 12 V DC).
13. Black (ground)
To vehicle (metal) body.
14. Red
To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
15. Orange
To terminal always supplied with power regardless of ignition switch position
16. Fuse resistor
17. Fuse holder
18. With a 2 speaker system, connect to the 2 speakers in the front or the rear.
19. Use this for connections when you have the separately available amplifier.
20. Front/left speaker
21. Front/right speaker
22. Rear/left speaker
23. Rear/right speaker
24. Green
25. Gray
26. Green/black
27. Gray/black
28. Green/red
29. Gray/red
30. Black/green
31. Black/gray

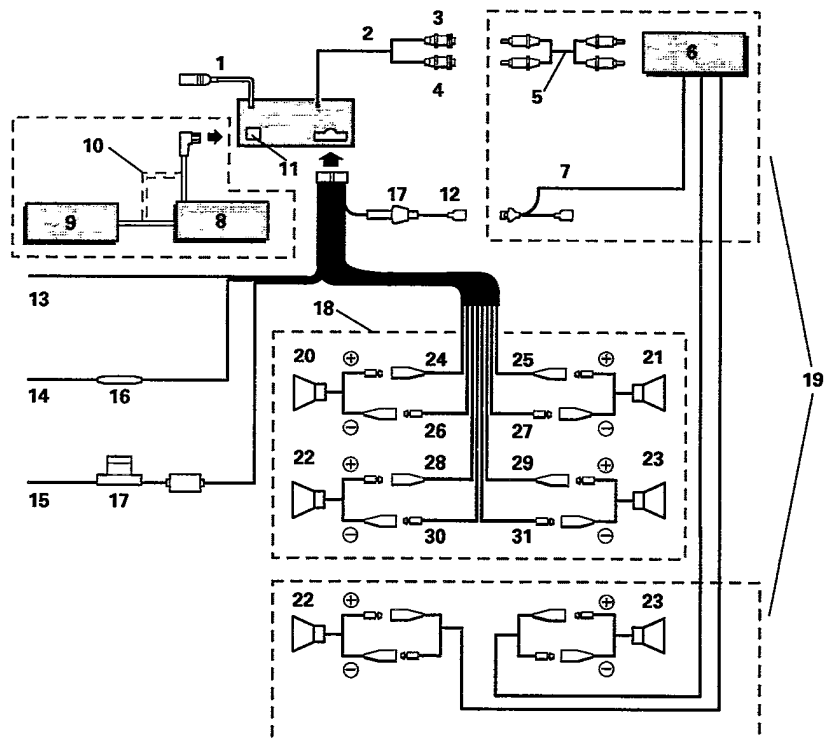
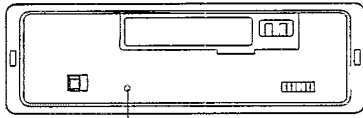


Fig. 7

Using the Clear Button

- The clear button can be located on the unit after you have removed the front panel. (Fig. 8)
Refer to the previous page to find out how to remove the front panel.



[41] Clear Button

Fig. 8

Once all wiring is complete, press button [41] with a thin, pointed object. Though not a normal occurrence, the microprocessor which controls the operation of this unit can be affected by electrostatic noise. This generally is indicated by such symptoms as no power being supplied when you switch the unit on, failure of buttons and controls, or an abnormal display. Should this happen, press button [41] with a thin, pointed object to reset the microprocessor.

Switching Power On

Parts Identification

Fig. 1

- [3] Source selector
- [5] Cassette door
- [13] Function buttons
- F1: AUX ON/OFF

Changing the Source

Each time you press button [3], the source changes as follows.

- Tape — Radio — Multi-play CD player
- AUX — OFF

Tape

- When there is no cassette tape loaded in this unit, the source does not switch to Tape.
- The source switches to TAPE when a cassette is inserted into [5] on this unit.

Multi-play CD player

- When no Multi-play CD player is connected to this unit, the source does not change.

AUX

- When no other components are connected to this unit, or when the AUX (external input) is set to OFF, the source does not change. Switch the AUX (external input) to ON.
Hold down button F1 in Bank [13] and set the ignition switch from OFF to ON.

Adjusting Volume and Tone

Parts Identification

Fig. 1

- [1] Volume/Audio adjustment
- [2] Shift
- [9] Display

Fig. 2

- [17] Loudness

Mode Selection

Each press of button [2] changes the mode as follows:

Volume adjustment (VOL) — Balance adjustment (FAD/BAL) — Tone adjustment (BAS/TRE) — FIE mode

- When you are adjusting fader, balance, bass or treble settings, the indicator will stop at the center setting briefly.
- If no operations are performed within 8 seconds, adjustment modes are canceled. Make adjustments within 8 seconds.

Volume Adjustment

Pressing the (+) side of button [1] increases the volume, while the (-) side decreases it. (Display shows "VOL 00" ~ "VOL 30".)

- When driving your vehicle, be sure to keep the volume of the unit set low enough to allow you to hear sounds coming from outside.

Balance Adjustment

Press button [2] to select balance adjustment mode. ("FAD" appears on the display.) Adjust the fader using the (+) or (-) side of button [1]. To adjust the balance, pressing either the (◀) or (▶) side of button [1] will turn on "BAL". Then use the (◀) or (▶) side of the button to adjust balance.

Fader

When you press the (+) side of button [1], the front speakers volume increases gradually while the rear speakers volume decreases. When you press the (-) side of button, the rear speakers volume increases gradually while the front speakers volume decreases.

(Display shows "FAD F15" ~ "FAD R15".)

- Please set "FAD 0" when using 2 speaker system.

Balance

Pressing the (◀) side of button [1] shifts the balance to the left speaker, while the (▶) side shifts it to the right speaker. (Display shows "BAL L9" ~ "BAL R9".)

Tone Adjustment

Press button [2] to select tone adjustment mode. ("BAS" appears.) Select the tone you wish to adjust using the (◀) or (▶) side of button [1]. Pressing the (▶) side boosts the TRE: pressing the (◀) side boosts BAS.

Bass Adjustment

Select the Bass mode.

Pressing the (+) side of button [1] increases bass, while the (-) side decreases bass. (Display shows "BAS -6" ~ "BAS +6".)

Treble Adjustment

Select Treble adjustment mode.

Pressing the (+) side of button [1] increases treble, while the (-) side decreases treble. (Display shows "TRE -6" ~ "TRE +6".)

Switching the F. I. E. function

Pressing the (▶) side of button [1] turns the F. I. E. (Front Image Enhancer) function on. Pressing the (◀) side of button [1] turns it off.

Using the F.I.E. function

The F.I.E. (Front Image Enhancer) function cuts middle and high range frequency output from the rear speakers so that only low-range frequencies are output, for a simple way to enhance front imaging.

- Press button [2] to switch to the F.I.E. mode.
- Press the (▶) side of button [1] to switch the F.I.E. mode ON.
- Switch to the Fader mode, and balance front volume and rear bass volume.
- Adjust volume and tone.

Note:

- If you turn off the F. I. E. function, the rear speakers will output all sounds in addition to the bass sounds. This will cause a sudden increase in volume. Therefore, be sure to reduce the volume before turning off the F. I. E. function.

Loudness

This "loudness" function enhances both the high and low ranges of sound to give even more power to output even at low volume.

Hold down the button [2] for more than 2 seconds, the loudness function turns on. (The "LOUD" [17] indicator appears on the display [9].)

Hold down the button [2] again for more than 2 seconds, the loudness function turns off.

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Using the Radio

Parts Identification

Fig. 1

- [1] Tuning
- [3] Source selector
- [7] Band/Manual
- [9] Display
- [10] Preset
- [11] AF/REG
- [12] TA
- [13] Function buttons
 - F1: Best stations memory (BSM)
 - F2: Frequency display
 - F3: FM stereo, mono/Local station
 - F4: PTY

Fig. 2

- [14] FM stereo
- [15] TA
- [16] AF
- [18] EON
- [19] TP
- [20] PTY
- [21] REG
- [22] Manual
- [23] Frequency
- [24] Local station
- [25] FM mono
- [26] Band
- [27] Preset number

Listening to the Radio

• Electronic Tuner

Frequency allocation differs depending upon the area. This unit has been designed in accordance with the frequency allocations for Western Europe, Asia, the Middle and Near East, Africa, Australia and Oceania. Use in other areas may result in improper reception of AM. The RDS function does not work in regions with no RDS broadcast services.

1. Press button [3] to switch the radio power on.
2. Press button [7] to select a band.

F1 → F2 → F3 → MW/LW

(FM1) (FM2) (FM3) (MW/LW)

Use the (◀) and (▶) sides of button [1] to change between MW (531 — 1,602 kHz) and LW (153 — 281 kHz).

3. Use seek tuning to tune in a frequency. Press the (▶) side of button [1] to automatically tune in the next higher receivable frequency, and the (◀) side for a lower frequency.

4. Adjust volume and tone.

5. Assign the tuned frequency to one of the buttons in Bank [10] (preset memory).

Press and hold down one of the buttons in Bank [10] for at least 2 seconds. The frequency is assigned to the selected button when the preset number [27] stops flashing on the display. Up to 18 FM stations (6 FM1 stations, 6 FM2 stations, 6 FM3 stations), and 6 MW/LW stations can be assigned to the preset memory buttons in Bank [10].

6. Once a frequency is assigned to a button in Bank [10], you just need to press that button to tune it in.

This also causes the number of the button pressed to appear at position [27] on the display.

Adjusting Seek Sensitivity

The seek tuning function of this tuner lets you select between a local setting for reception of strong stations only, and a DX (distant) setting for reception of weaker stations.

Switching between Local and DX

Hold down the button F3 in Bank [13] for more than 2 seconds to switch between local and DX (distance).

When "LOC.S" [24] is shown on the display, seek tuning is performed with the local seek sensitivity. Otherwise, seek tuning is performed with the DX seek sensitivity.

Manual Tuning

Use manual tuning when stations are too weak to be picked up by seek tuning.

1. Hold down the button [7] for more than 2 seconds so that "MANU" [22] lights.
2. Each press of the (▶) side of button [1] increases the frequency in 50 kHz steps in the FM band, 9 kHz in the MW band and 1 kHz in the LW band. Pressing the (◀) side of button [1] decreases the frequency. Holding down either side of button [1] changes the frequency at high speed.

Switching between FM Stereo and Mono

Generally, it is best to allow the ARC (Automatic Reception Control) function to automatically set the optimum listening conditions. When stereo broadcasting is received, "◐" [14] will appear on the display. When there is a large amount of noise, you can press button F3 of Bank [13] for clearer mono reception ("MONO" [25] will appear on the display).

BSM (Best Stations Memory)

This function automatically locates stronger stations and automatically assigns their frequencies to the buttons in Bank [10], from strongest to weakest. It comes in handy when trying to find local stations while driving.

1. Press button [7] and select a band.
 2. Holding down button F1 of Bank [13] for about 2 seconds will start BSM search. At this time, "BSM" will flash on the display.
 3. The frequency display will return once BSM search is complete, and frequencies are assigned to preset buttons.
- You can cancel BSM search by pressing button F1 of Bank [13] again.
 - If there are fewer than 6 strong stations in the area, some of the preset buttons will not be assigned frequencies, so they will retain any frequencies assigned to them previously.
 - BSM search may take as long as 30 seconds in areas where there are few strong stations.

Using the RDS Function

What is RDS?

RDS (Radio Data System) according to a CENELEC EN50067 is a system for transmitting data signals from FM broadcast transmitter along with the normal sound program. These data signals, which are imperceptible to listeners, are intended to aid radio listeners in tuning their receivers to a desired station. RDS receivers can decode these data signals for display or control purposes.

RDS digital signal includes various data, such as PI, PS, AF, TP, TA, EON and PTY.

PIProgram Identification Code

PSProgram Service Name

AFList of Alternative Frequencies

TPTraffic Program Identification Code
(Similar to SK signal of ARI system)

TATraffic Announcement Code
(Similar to DK signal of ARI system)

EONEnhanced Other Network information Code. (In some countries, EON is not offered by broadcasters.)

PTYProgram type ID code

RDS Function of this Unit

This unit has the following functions for making use of RDS data.

- PS, the name of the currently listened station is displayed.
- AF (Alternative Frequency) function. This enables the receiver to automatically retune to more suitable frequencies transmitting the same program.
- TP/TA, EON, user selectable reception of the traffic information service, offered by RDS.
- PTY codes enable you to automatically receive stations broadcasting the same program content.

Network/Station Name Display

Switch the tuner on and choose one of the 3 FM bands.

When you tune into an RDS station with manual or seek tuning, the frequency display changes to the network/station name display after a few seconds by means of the PS code.

- The RDS functions of this unit use RDS codes transmitted along with FM broadcasts. RDS doesn't work on the MW or LW bands.
- The RDS functions may not work properly in areas where the RDS transmissions are at an experimental stage or where there are flaws in the broadcasting system.
- Hold down button F2 of Bank [13] for more than 2 seconds to change the network/station name display to a frequency display. The frequency will be displayed only while the button is being held down.

AF Function

This receiver retunes automatically to a more suitable transmitter, contained in the list of Alternative Frequencies (AF), to enable the motorist to keep listening to programs in the same network.

Example:

If a motorist travels as shown below, from point A to point B, (and has selected AF function) then the receiver will automatically retune to a more suitable frequency transmitting the same program. This is shown by the automatic retuning from 98.5 MHz to 107.5 MHz to 96.0 MHz to 102.5 MHz.

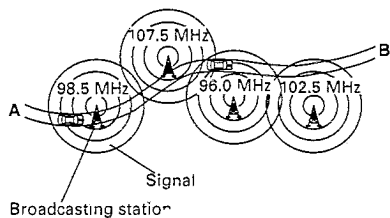


Fig. 9

To activate the Alternative Frequency Function, press button [11], "AF" [16] will appear on the display. Once tuned to a RDS station, as long as you drive within an area served by the same network, the receiver will automatically retune to a more suitable station transmitting the same program, by utilizing the data in the AF list.

- "PI SEEK" will appear on the display, if the AF function has been selected, and a suitable AF station cannot be found. In this case, the receiver will mute the radio sound and search the frequency band, in order to find a station with the same PI code. The receiver will return to the original frequency if the same or related PI code cannot be found.
 - The AF function will not work in the following cases:
 - when the receiver is tuned to a non-RDS station. (local station)
 - when the RDS station does not transmit any AF list data.
 - when the receiver cannot receive the AF list due to disturbances.
- When the receiver is unable to find a PI code the "AF" [16] indicator will flash on the display. Thus indicating that the AF function cannot be performed.

Preset Recall

- When recalling preset stations in the AF mode, the tuner will be tuned to the stored frequency and the AF function will be operative i.e. when the signal of the recalled station is weak or has a different PI, the radio will look into the AF list and if necessary start a PI-seek in order to find a station with the same or related PI code. When the tuner is performing a PI seek "PI SEEK" is shown on the display. If the PI seek is successful, the tuner will be tuned to the new frequency that transmits the same program service (i.e. with the same PI code) and the display will show the stored PS.

If the PI seek is not successful, the tuner will return to the stored frequency. If a new station (with a different PI code) would be received on this frequency, this station will become audible.

- When recalling preset stations in the AF=OFF mode, the tuner will be tuned to the stored frequency and the display will show the stored PS. In case the tuned station has a PI code that is different from the stored one, the tuner will accept the new PI code and stay tuned to the initial frequency. The display will show the new PS when the signal of the tuned station is strong enough.

Listening to Regional Stations

In some countries a particular program service may "opt out" during a certain part of the day in several regional variants from particular locations. Since these regional variants are broadcasting a different program they temporarily have a PI and a PS that is different from the main program service. The PI's are mostly "generically linked". The AF list may either be common for all regional variants or each regional variant may have its own AF list. In other countries there may be regional stations which are not an "opt out" of a particular main program service but which have an independent existence. These regional stations have a different PS. Their PI's may be "generically linked" and their AF lists may carry frequencies which are alternatives for that regional station only.

1) Regional OFF Mode

When AF is ON and REG is OFF, the receiver will switch automatically to regional stations that are likely to be broadcasting the same program but which do not necessarily match the region code. If this results in repeated reception of undesired different program contents, switch to the REG ON mode.

2) Regional ON Mode

When AF is ON and REG is ON, the receiver will switch automatically only to regional stations that precisely match the region code and are therefore definitely broadcasting the same program.

REG ON/OFF

To put the radio in the REG ON mode, press button [11] for more than 2 seconds. "REG" [21] will appear on the display. To cancel the REG ON mode i.e. to put the radio back in the default REG OFF mode, press button [11] again. "REG" [21] will disappear from the display.

PTY function

This unit's PTY function uses the PTY codes put out by the RDS station to provide three functions: PTY Display, PTY Seek and PTY Alarm.

- PTY Display is a function that shows the program type of a received station if the broadcast station is an RDS station and is putting out a PTY code.
- PTY Seek is a function that receives RDS stations broadcasting the program type that the user has selected beforehand.
- PTY Alarm is a function that receives an

RDS station after picking up an emergency PTY alarm code put out by that station when a natural disaster or nuclear accident, etc., has occurred.

PTY indication switching

When an RDS station is received, the network/station name display appears. At this point, if the unit has picked up the PTY code, press F2 button in Bank [13], and PTY (program type) will be displayed for about 8 seconds.

- PTY display contents are of the following 16 types: NO PTY, AFFAIRS, CLASSICS, CULTURE, DRAMA, EASY MUS, EDUCATE, INFO, L. CLASS, NEWS, OTH MUS, POP MUS, ROCK MUS, SCIENCE, SPORT, VARIED
- Some stations may broadcast program contents that differ from the PTY code.
- "NO PTY" is displayed when no PTY code can be picked up from the received station.

Setting the program type

1. Press and hold down F4 button in Bank [13] for at least 2 seconds to switch to the PTY setting mode. ("PTY" [20] will light and the program types will be shown on the display for about 5 seconds.)
2. While the program types are shown on the display, press the (◀) side or (▶) side of the [1] button to select the type that you want.

Note:

In the CURRENT mode, if the currently received station is an RDS station and the PTY code has already been picked up, then the program type is automatically set to match that station's PTY code.

PTY SEEK

For automatic reception of RDS stations having the PTY code that you have selected beforehand.

Pressing F4 button in Bank [13] causes your selected program type to flash on the display and PTY SEEK to begin. ("PTY" [20] flashes)

- If PTY SEEK is unsuccessful, "NO PTY" will be shown on the display for about 2 seconds, after which it will return to the station received before PTY SEEK began.
- Non TP RDS stations may be received during PTY seek even if TA (Traffic Information Standby) is on. In this case an alarm sounds about 30 seconds to tell you that it is not a TP station.
- PTY seek automatically receives RDS stations having a different PI code with the set PTY code with the set PTY code. However, it will return to the previous station if "NO PTY" is displayed.

PTY Alarm

Among the PTY codes there is also one for emergency announcements warning of natural disasters, nuclear reactor accidents, etc. In case of such disasters, RDS stations may output this emergency PTY alarm code. When this unit is ON (not during MW/LW reception), and this PTY code is picked up, ALARM will light on the display, volume will be set to TA interrupt level, and that RDS station will be received. When the RDS station stops putting out the emergency PTY alarm code, the unit will return to the previous source. To return to the previous source during reception of the emergency program, press button [12].

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Traffic Information Reception

TP and EON-TP function

When a traffic information station (TP station) is selected, "TP" [19] lights on the display, thus indicating traffic report can be received through this station. The "EON" [18] and "TP" [19] indicator will light on the display when a selected station (this network) is broadcasting EON information which cross-references at least one program service which carries traffic information, thus indicating traffic report can be received through another program service by using the EON function of this unit.

In both cases, by briefly pressing button [12], traffic report waiting status will be entered.

Traffic information reception by EON-TP.

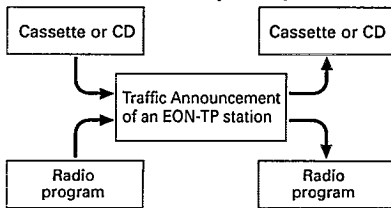


Fig. 10

Traffic Announcement Volume Adjustment

- The volume level for traffic information broadcasting is temporarily stored in memory.

TP Alarm Function

- In TA mode, about 30 seconds after "TP" [19] disappears from the display, which occurs if the signal from the TP becomes weak, an alarm sounds for 10 seconds to tell you to tune to another TP station.

TA Reception during CD or Cassette Play

- If the radio is already set to the FM band and tuned to a TP or EON-TP station, even when listening to the cassette or the multi-play CD player, when the button [12] is pushed ("TA" [15] is shown on the display), traffic report waiting will begin. When a traffic report begins, the system will switch from cassette or CD to the traffic report.

BSA Function

- While button [12] is on, ("TA" [15] is shown on the display) and AF is off, and you are listening to either the cassette or multi-play CD player, should the TP station become weak, the radio will start BSA (Best TP Station Auto Search) 10 seconds after "TP" [19] disappears from the display. The tuner will automatically tune to the strongest TP station in the area, and will stand by for a traffic bulletin. BSA does not work when the AF function is selected, so press button [11] to turn the AF function off.

TP Alarm Function

- In AF mode, about 30 seconds after "TP" [19] disappears from the display, which occurs if the signal from the TP becomes weak, an alarm sounds for 10 seconds to tell you to tune to another TP station.

Tuning Functions on each RDS mode

Tuning Mode	AF Mode	TA Mode & AF plus TA Mode
Seek Tuning will stop to find,	RDS Stations	TP or EON-TP Station
BSM will select and memorize in presets,	RDS Stations	TP Stations

Non-RDS stations such as those using the Swedish MBS system may be tuned in as RDS stations, but this is due to both systems using the same 57 kHz subcarrier frequency and is not a malfunction of the unit.

Tuning Steps

The tuning step is normally 50 kHz during seek tuning on an FM band. However this tuning step changes to 100 kHz when the set is in AF or TP mode. In some countries it may be desired to set a tuning step of 50 kHz in AF mode by holding down button 1 of Bank [10] while turning the ignition key from OFF to ON.

- During manual tuning, the step does not change; it remains fixed at 50 kHz.
- The tuning step will return to 100 kHz if the batteries supply is temporarily disconnected or the clear button is pressed.
- In AF mode, only those stations being broadcast at 100 kHz steps are subject to AF reception (CENELEC STANDARD).

Using the Tape Deck

Parts Identification

Fig. 1

- [3] Source selector
- [4] Eject
- [5] Cassette door
- [6] Fast forward, Rewind/Direction change
- [9] Display
- [13] Function buttons
 - F1: FLEX (Frequency Level Expander)
 - F2: Dolby B NR (KEH-P520RDS, KEH-P510RDS)
 - F3: Metal (KEH-P520RDS, KEH-P510RDS)

Fig. 3

- [28] FLEX
- [29] Metal (KEH-P520RDS, KEH-P510RDS)
- [30] Tape play
- [31] Dolby B NR (KEH-P520RDS, KEH-P510RDS)

About Cassette Tapes

- Do not use tapes longer than C-90-type (90 min.) cassettes. Longer tapes can interfere with tape transport.
- A loose or warped label on a cassette tape may interfere with the eject mechanism of the unit or cause the cassette to become jammed in the unit. Avoid using such tapes or remove such labels from the cassette before attempting use.

- Storing cassettes in areas directly exposed to sunlight or high temperatures can distort them and subsequently interfere with tape transport. (Fig. 11)



Fig. 11

- Store unused tapes in a tape case where there is no danger of them becoming loose or being exposed to dust.

Cleaning the Head

- If the heads become dirty, the sound quality will deteriorate and there will be sound dropouts and other imperfections in performance. In this case, the head must be cleaned.
- When using a cleaning tape, play it once on one side for normal cleaning. Excessive use of the cleaning tape will increase head wear. Be sure to read the cleaning tape instructions before use.

Listening to a Tape

- By inserting the cassette tape into slot [5], power will be turned on and the tape will begin to play.

At this time, the tape running, tape play indicator [30] will light up to your satisfaction.

- Adjust volume and tone.
- To stop tape play, press button [3] to switch the source OFF, or press button [4] to eject the cassette.

- Do not try to eject the cassette immediately after insertion, as it may result in malfunction. Wait a few seconds.
- Be sure to eject the tape when the front panel is removed, or the vehicle's ignition is turned OFF. Leaving the tape in the unit can deform the pinch roller causing wow and flutter during tape playback.
- Loose tapes should be rewound with the aid of a pencil and unevenly wound tapes rewound with the use of the fast forward function.

Changing Program

Push the fast forward and rewind buttons [6] together to switch from one side of the tape to the other (from Side A to Side B or vice versa).

KEH-P5200RDS, P5100RDS, P4200RDS, P4100RDS, KEH-P24RDS, P14RDS, 3900RDS, 3800RDS

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Dolby B NR (KEH-P5200RDS, KEH-P5100RDS)

To hear a tape recorded using a Dolby NR system, press button F2 of Bank [13]. ("DC" [31] appears.)

- Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
- "DOLBY" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Tape Selector (KEH-P5200RDS, KEH-P5100RDS)

When using metal tapes and chrome tapes, press button F3 of Bank [13]. ("MTL" [29] appears.)

Using Fast Forward and Rewind

Since the transport can be in either direction, both the left and right high-speed tape transport buttons [6] can be regarded as fast forward/rewind buttons.

For fast forward, press the high-speed tape transport button [6] that corresponds to the direction that is shown by the tape play indicator [30]. When the end of the tape is reached, playback will automatically begin from the opposite side of the tape (Auto-reverse).

For rewind, press the button [6] that is opposite that of the direction shown by the tape play indicator [30]. When the end of the tape is reached, playback will automatically begin from the beginning of the same side of the tape (Auto-replay).

When you release fast forward/rewind, lightly press button [6] located on the opposite side of the one you pressed to fast forward or rewind.

- "<-->" [30] will flash when the tape is fast forwarding or rewinding.

FLEX (Frequency Level Expander)

If the high-frequency performance is poor when playing back an old or poorly recorded cassette, you can improve it by pressing button F1 in Bank [13]. ("f" [28] appears.)

- *This function may have little effect on a cassette offering good sound quality, for instance, one recorded from compact disc.*

Playing Compact Discs

Precautions When Using the Multi-Play CD Control

- This unit can control multi-play CD players when it is used with multi-play CD player (CDX-P1210, CDX-P610).
- If the P-BUS extension adapter is used, up to 4 multi-play CD players can be connected. When two or more CD players are connected, their priorities must be specified for the Multi-play CD players. See the Multi-play CD player's instructions and set the address switches correctly.
- The Owner's Manual for the multi-play CD player does not contain an explanation of the CD controls for this unit. Read this Owner's Manual for details on proper operation and keep it handy for later reference.

Parts Identification

Fig. 1

- [1] Track number search/Fast forward, Reverse
- [3] Source selector
- [7] Multi-play CD player select/Manual
- [9] Display
- [10] Disc number search
- [13] Function buttons
 - F1: Play mode switching/Program erase
 - F2: Display switching/Disc title
 - F3: ITS (Instant Track Selection)/ITS play
 - F4: Random play/Digital compression

Fig. 4

- [32] Multi-play CD player number display
- [33] Magazine repeat mode display
- [34] Disc repeat mode display
- [35] COMP
- [36] DBE
- [37] Play elapsed time display
- [38] Manual
- [39] Track number
- [40] Disc number

Using the Multi-Play CD Player

1. Press button [3] to change the display to the multi-play CD player mode and to begin disc play.

2. Use the Disc Number Search function to select a disc.

Select the desired disc by pressing one of the Disc number search buttons. The number of the disc selected appears at position [40] on the display.

- When connected to the 12-disc changer, to select discs 7 – 12, press buttons 1 – 6 and hold for at least 2 seconds.

Example:

To select disc 7, press button 1 in Bank [10] and hold for 2 seconds more.

- If the number at position [40] on the display does not change when you press a Disc number search button, it means that there is no disc loaded in that tray.

3. Adjust volume and tone.

4. To stop disc play, press button [3].

At another press, the normal play resumes from about where it stopped.

Note:

- When you turn the power on or change the disc to be played, the multi-play CD player may perform a preparatory operation (verifying there is a disc, reading disc information, etc.). "READY" is displayed during this time.
- When the multi-play CD player is not working correctly, an error message appears on the display (Ex.: "ERROR-80"). Identify the error from the multi-play CD player owner's manual.
- After you press a Disc number search button, it may take some time before play begins due to the time necessary to load and set the disc in the mechanism.

Multi-Play CD Player Switching

Up to 4 Multi-play CD players can be connected to this unit. When several multi-play CD players are connected, you can select the one you want to play.

Each press of button [7] selects multi-play CD players 1 to 4. The Multi-play CD player number appears on the display [32].

KEH-P520ORDS, P510ORDS, P420ORDS, P410ORDS, KEH-P24RDS, P14RDS, 390ORDS, 380ORDS

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Track Number Search

The desired track on the disc currently being played can be selected by track (or song) number.
Confirm that Track Number is shown at Position [39] on the display. If not, press button F2 of Bank [13].
Press the (▶) side of button [1] to increase the number at Position [39], or the (◀) side to decrease the number. Holding either side of button [1] changes the track number at high speed.

Using Fast Forward and Reverse

1. Hold down the button [7] for more than 2 seconds so that "MANU" [38] lights.
 2. Press the (▶) side of button [1] for fast forward, and the (◀) side for reverse.
- Sound is output during fast forward and reverse operations.

Repeat

You can select one of the play modes (repeat modes) listed below.

Play mode (repeat mode)	Operation
One-Track Repeat	Play the current track repeatedly. • When you perform track number search or fast forward or rewind, the mode changes to disc repeat mode. • Switching the multi-CD player being played or the disc switches to magazine repeat mode.
Disc Repeat	Play the same disc repeatedly. • Switching the multi-CD player being played or the disc switches to magazine repeat mode.
Magazine Repeat	Play all discs loaded in the magazine in the multi-play CD player repeatedly. All discs in the magazine are played repeatedly from the first disc.
ALL Repeat	The mode changes to this mode when 2 or more multi-play CD players are connected. Multi-play CD players 1 to 4 are played.

Each press of button F1 in Bank [13] causes the mode to change as follows:
One-Track Repeat ("RPT" appears on the display [37]) → Disc Repeat ("DISC" [34] appears)
→ Magazine Repeat ("M-CD" [33] appears) → ALL Repeat

Random Play

The microcomputer of the multi-play CD player can play tracks on discs in a random order. Random play is performed according to the current play mode (repeat mode) as follows:

Play mode (repeat mode)	Tracks to be played at random
One-Track Repeat	All tracks on the disc being played. • The play mode changes to disc repeat mode.
Disc Repeat	All tracks on the disc being played.
Magazine Repeat	All tracks on the discs in the magazine being played.
ALL Repeat*	All tracks on all discs in multi-play CD players 1 to 4.

* When 2 or more multi-play CD players are connected.

1. Select the desired random play mode (repeat mode).
2. Press button F4 in Bank [13]. ("RDM" appears on the display [37].) To cancel random play, press button F4 in Bank [13] again. ("RDM" disappears.)

ITS (Instant Track Selection)

This function lets you program and play the tracks you want. You can listen to just your favorite tracks.

- The ADPS function* of the multi-play CD player lets you program up to 100 discs. (Up to 100 discs can be programmed including disc title inputs.)
* ADPS: Automatic Disc Program Selection
- Up to 99 tracks can be programmed for a single disc.
- When the number of discs exceeds 100, discs not being played (information not being renewed) in memory is overwritten by the newest.
- Tracks are programmed for each disc. Programmed tracks are not erased after the disc is changed.

Programming

1. Play the track you want to program.
 2. Press button F3 in Bank [13] to program the track.
("ITS" appears on the display [37] for 3 seconds.)
- Program tracks while ITS play is not in progress. It is possible during scan play or random play.

ITS Play

Tracks stored only in memory are played in order. Tracks are played according to ITS play mode (repeat mode) as follows:

Play mode (repeat mode)	Tracks to be played by ITS
One-Track Repeat	Programmed tracks on the disc being played. • The play mode changes to disc repeat mode.
Disc Repeat	Programmed tracks on the disc being played.
Magazine Repeat	Programmed tracks on the discs in the magazine being played. • If the disc being played contains no programmed tracks, the next disc containing programmed tracks is played.
ALL Repeat*	Programmed tracks on all discs in all magazines in multi-play CD players 1 to 4. • If the disc (multi-play CD) being played contains no programmed tracks, the next disc (multi-play CD) containing programmed tracks is played.

* When 2 or more multi-play CD players are connected.

KEH-P520ORDS, P510ORDS, P420ORDS, P410ORDS, KEH-P24RDS, P14RDS, 390ORDS, 380ORDS

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1. Select the desired ITS play mode (repeat mode).
2. Hold down button F3 in Bank [13] for more than 2 seconds. ("ITS.P" appears on the display [37].) To cancel ITS play, hold down button F3 in Bank [13] for more than 2 seconds again. ("ITS.P" disappears.)
- If you try to play a track that is not programmed within the play range of the selected repeat mode by ITS, "EMPTY" will appear on the display [37] for about 3 seconds, indicating that ITS play is not possible.
- You can perform scan play or random play during ITS play. In this case, scan play or random play applies to all the tracks stored in memory. (If the play mode is the magazine repeat mode or all repeat mode, scan play applies to all the tracks of the discs in the magazine stored in memory.)
- During ITS play, multi-play CD players containing discs with programmed tracks are switched, and disc and track number search is performed on programmed tracks. So, you cannot switch to any tracks or discs that are not stored in memory.
- When you turn the power on or change the disc to be played, the multi-play CD player may perform a preparatory operation (verifying there is a disc, reading disc information, etc.). "READY" is displayed during this time.

Erasing the ITS Program

You can erase one or all selections of the program for the disc being played by ITS.

To erase a single selection:

1. Start ITS play.
2. Play the track you wish to erase by using disc number search or track number search.
3. Hold down button F1 in Bank [13] for more than 2 seconds. ("CLEAR" appears on the display [37] for about 3 seconds.)

To erase the disc program:

1. Start normal play.
2. Play the disc you wish to erase by using disc number search.
3. Hold down button F1 in Bank [13] for more than 2 seconds to erase the program. ("CLEAR" appears on the display [37] for about 3 seconds.)

Disc Title Input

You can enter a title for the disc in the multi-play CD player. The title stored for the disc can be displayed.

- The ADPS function* of the multi-play CD player lets you enter titles for up to 100 discs. (Up to 100 discs, including ITS, can be programmed.)
- *ADPS: Automatic Disc Program Selection
- A disc title can consist of up to 8 characters for a single disc.
- When the number of discs exceeds 100, discs not being played (Information not being renewed) in memory is overwritten by the newest.
- One title is stored for each disc. The title stored for a disc is not erased after the disc is changed.

Entering Titles

1. Select the disc for which you want to enter a title.
2. Hold down button F2 in Bank [13] for more than 2 seconds to select title input mode.
3. Press the (◀) or (▶) side of button [1] to select the input position. The input position moves continuously when you hold down either side of the button.



4. Select characters using the (+) or (-) side of button [1]. When you hold down either side of the button, the character changes continuously. Each press of the (+) side changes the character from "A → B → C...", while each press of the (-) side changes the character from "C → B → A". To enter a space, press the space sign (_).
5. Enter all characters by repeating steps 3 and 4. Press button F2 in Bank [13] to store them in memory. The title will appear on the display.
- To modify an input title, carry out steps 1 to 5 above again.

Display Switching

Each press of button F2 in Bank [13] switches the display [37] between the elapsed play time and disc title.

When you press button [7] while the disc title is being displayed, the normal operation display will appear for 8 seconds.

CD sound quality adjustment function

If you connect a Multi-play CD player with COMP (Compression) and D.B.E. (Dynamic Bass Emphasis) functions to this unit, you can use these functions with this unit. (If you connect a Multi-play CD player that does not feature these functions, even if you try to switch to these functions, "NO COMP" is displayed, indicating that switching is not possible.)

COMP (Compression) function

This function suppresses loud sounds while boosting quiet sounds to reduce the difference between the two.

Use this function if there is distortion when you raise the volume.

When the COMP function is ON, "COMP" [35] lights in the display.

D.B.E. (Dynamic Bass Emphasis) function

When listening in a car, bass sound may be insufficient. This function boosts bass. When the D.B.E. function is ON, "DBE" [36] lights in the display.

COMP and D.B.E. switching

You can switch between two COMP and D.B.E. levels.

Level switching of both functions at the same time is not possible.

1. Press button F4 in Bank [13] for more than 2 seconds to select the switching mode.
2. Each time you press button F4 in Bank [13], the mode changes as follows.
COMP OFF → COMP 1 → COMP 2 → COMP OFF → DBE 1 → DBE 2 → COMP OFF
- With both COMP and D.B.E., the second mode is more effective.