STR-D560Z/D660Z/DE615/DE715

SERVICE MANUAL

US Model
STR-D560Z/D660Z/DE615/DE715

Canadian Model
STR-DE615/DE715

Australian Model
STR-DE715

Photo : STR-DE615

SPECIFICATIONS

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION

With 8-ohm load, both channels driven, from 20 - 20,000 Hz, rated 100 watts per channel, minimum RMS power, with no more than 0.09% total harmonic distortion from 250 milliwatts to rated output (US model only).

Amplifier section

POWER OUTPUT

Stereo mode (8 ohms 20 Hz - 20 kHz, THD 0.09%)
100 W + 100 W

Surround mode (8 ohms at 1 kHz, THD 0.8%)
Front: 100 W/ch
Center (PRO LOGIC mode): 100W
Rear: 100 W/ch

5.1/DVD mode (8 ohms at 1 kHz, THD 0.8%)
Front: 100 W/ch
Center: 100W
Rear: 100 W/ch

Dynamic power output
155 W + 155 W, 8 ohms
110 W + 110 W, 4 ohms

Harmonic distortion at rated output
Less than 0.09%

Frequency response
PHONO: RIAA equalization curve ±0.5 dB
CD, TAPE, DAT/MD, VIDEO 1, 2,:
10 Hz - 50 kHz $^{+1}_{-3}$ dB

Inputs

	Sensitivity	Impedance	S/N (weighting network, input level)
PHONO	2.5 mV	50 kilohms	75 dB* (A, 2.5 mV)
CD	200 mV	50 kilohms	82 dB* (A, 150 mV)
TAPE, DAT/MD, VIDEO 1, 2, TV/DBS	150 mV		
5.1 INPUT	200 mV	50 kilohms	82 dB* (A, 150 mV)

* '78 IHF

Outputs
VIDEO 1, 2 AUDIO OUT:
Voltage: 150 mV, Impedance: 10 kilohms
WOOFER:
Voltage: 2 V
Impedance: 1 kilohms
PHONES:
Accepts low and high impedance headphones

BASS BOOST +10 dB at 70 Hz

TONE ±8 dB at 100 Hz and 10 kHz

FM tuner section

Tuning range 87.5 - 108.0 MHz

Antenna terminals
75 ohms, unbalanced

Sensitivity
Mono: 18.3 dBf, 4.5 μV
Stereo: 38.3 dBf, 45 μV

Usable sensitivity
11.2 dBf, 2 μV (IHF)

S/N
Mono: 76 dB
Stereo: 70 dB

Harmonic distortion at 1 kHz
Mono: 0.3%
Stereo: 0.5%

Separation 45 dB at 1 kHz

Frequency response
30 Hz - 15 kHz $^{+0.5}_{-2}$ dB

Selectivity 60 dB at 400 kHz

– Continued on page 2 –

FM STEREO/FM-AM RECEIVER

MICROFILM

SONY®

AM tuner section

Tuning range US, Canadian model :
With 10 kHz interval**:
530 - 1710 kHz
With 9 kHz interval:
531 - 1710 kHz
Australian model :
531-1602 kHz

Antenna Loop antenna

Usable sensitivity
50 dB/m (at 1,000 kHz or 999 kHz)

S/N 54 dB (at 50 mV/m)

Harmonic distortion
0.5 % (50 mV/m, 400 kHz)

Selectivity At 9 kHz: 35 dB
At 10 kHz: 40 dB

** You can change the AM tuning interval to 9 kHz (US and Canadian model only). After tuning in any AM station, turn off the receiver. Hold down the PRESET TUNING + button and press the POWER button. All preset stations will be erased when you change the interval. To reset the interval to 10 kHz, repeat the procedure.

Video section

Inputs VIDEO 1, 2, TV/DBS, 5.1 INPUT:
1 Vp-p 75 ohms

Outputs VIDEO 1, 2, MONITOR:
1 Vp-p 75 ohms

General

System Tuner section:
PLL quartz-locked digital synthesizer system
Preamplifier section:
Low-noise NF type equalizer
Power amplifier section:
Pure-complimentary SEPP

Power requirements
Australian model:
240 V AC, 50 Hz
US, Canadian model :
120 V AC, 60 Hz

Power consumption
US model: 280 W
Canadian model:
480 VA
Australian model:
280 W

AC outlets Australian model:
1 switched, total 100 W
Other models:
2 switched, total 120 W

Dimensions 430 × 155 × 350 mm
(17 × 6 1/8 × 13 7/8 inches)

Mass (Approx.) 9.8 kg (21 lb 9 oz)

Supplied accessories
See page 4.

Design and specifications are subject to change without notice.

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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer :
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers).
Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCAWT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The " limit" indication is 0.75V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

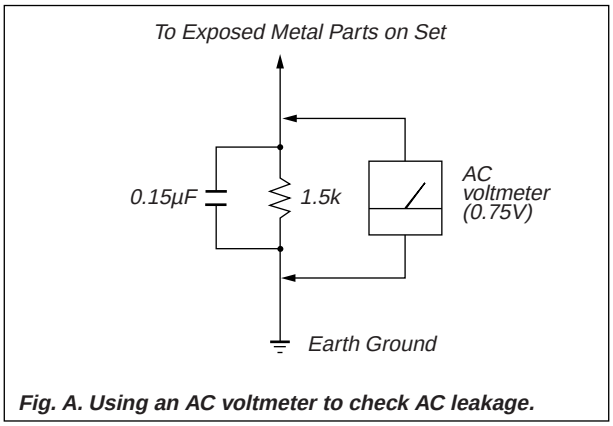


Fig. A. Using an AC voltmeter to check AC leakage.

SAFETY-RELATED COMPONENT WARNING!!

**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION.
REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

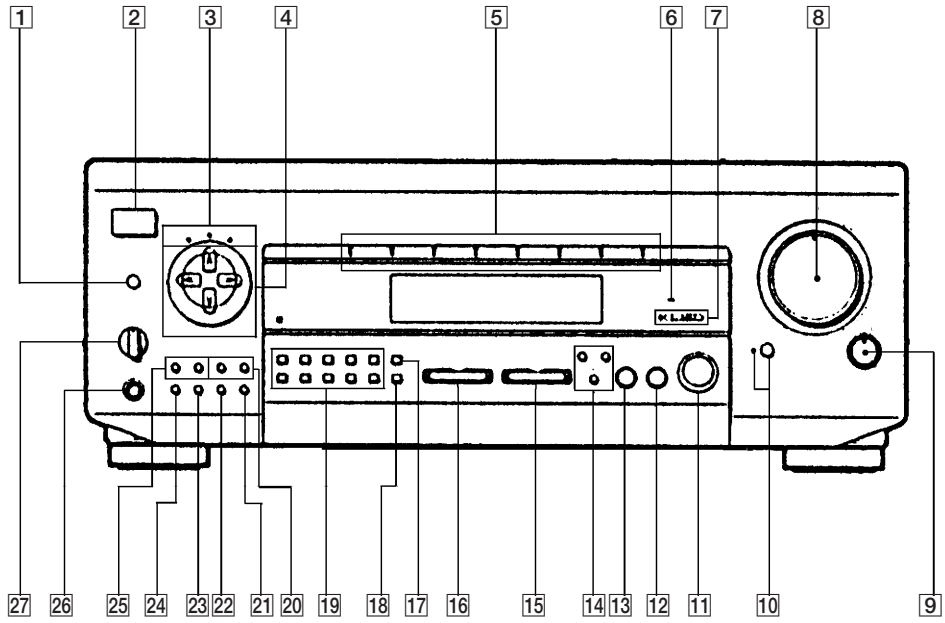
LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1
GENERAL

This section is extracted from instruction manual.

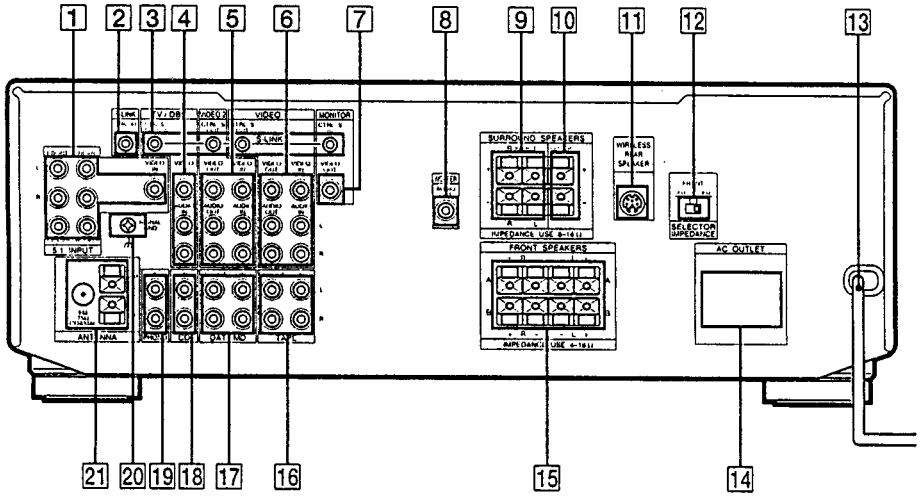
LOCATION AND FUNCTION OF CONTROLS

[FRONT PANEL]



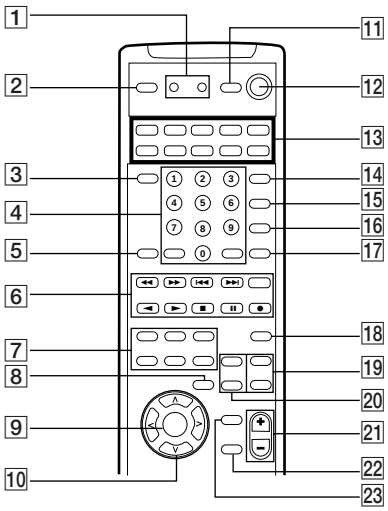
1 DPC MODE button
2 POWER switch
3 SUR, TONE, INDEX indicators
4 Digital processing control buttons
5 Function indicators
6 DIRECT PASS indicator
7 5.1 INPUT indicator
8 MASTER VOLUME control
9 BALANCE control
10 BASS BOOST button/indicator
11 SOUND FIELD ON/OFF button
12 MODE button
13 GENRE button
14 DIRECT PASS, SET UP, 5.1/DVD INPUT buttons
15 AUDIO FUNCTION buttons
16 VIDEO FUNCTION buttons
17 DIRECT button
18 SHIFT button
19 Numeric buttons
20 PRESET TUNING +,– buttons
21 MEMORY button
22 DISPLAY button
23 FM/AM button
24 FM MODE button
25 TUNING +,– buttons
26 PHONES jack
27 SPEAKERS switch

[REAR PANEL]



1 5.1 INPUT
2 S-LINK CTRL A1 (STR-DE715 : US, Canadian model)
3 CTRL S (STR-DE715 : US, Canadian model)
4 TV/DBS
5 VIDEO 2
6 VIDEO 1
7 MONITOR
8 WOOFER
9 SURROUND SPEAKERS (REAR)
10 SURROUND SPEAKERS (CENTER)
11 WIRELESS REAR SPEAKER (STR-DE715 and DE615 only)
12 IMPEDANCE SELECTOR
13 AC power cord
14 SWITCHED AC OUTLET(s) (Outlet shape and position varies according to destination)
15 FRONT SPEAKERS (A/B)
16 TAPE
17 DAT/MD
18 CD
19 PHONO
20 ⏚ SIGNAL GND
21 ANTENNA (AM/FM)

[REMOTE]



1 LEARN button/indicator
2 SLEEP button
3 TV CONTROL ON button
4 Numeric, ENTER buttons
5 BACKGROUND button
6 VCR/CD/DVD control buttons
7 SOUND FIELD buttons
8 DIRECT button
9 DPC MODE button
10 DIGITAL PROCESSING CONTROL buttons
11 VISUAL POWER button
12 SYSTEM OFF button
13 SYSTEM CONTROL/FUNCTION buttons
14 5.1/INPUT button
15 TV/VIDEO button
16 Direct TUNING button
17 CH/PRESET button
18 TEST TONE button
19 CENTER LEVEL +, – buttons
20 REAR LEVEL +, – buttons
21 MASTER VOL buttons
22 MUTING button
23 BASS BOOST button

SECTION 2
DIAGRAMS

2-1. IC PIN FUNCTION

IC103 MB90673PF-G-196-BND (SYSTEM CONTROL) (STR-D660Z/DE715)

Pin No.	Pin name	I/O	Description
1	AC MUTE	O	AC mute drive.
2	D. LAT	O	Data latch output.
3	T. LAT	O	Tuner function latch output.
4	S. CLK	O	Serial clock output.
5	S. DATA	O	Serial data output.
6	S. LAT	O	Serial latch output.
7	AUTO STOP	O	Tuner auto stop output.
8	T. MUTE	O	Tuner mute output.
9	STEREO	I	Stereo detect signal input.
10	IF DATA IN	I	IF data input.
11	VSS (D)	–	Ground.
12	V-A	O	Video switch control output.
13	V-B	O	Video switch control output.
14	RM INPUT	I	Remote control signal input.
15	V-E	O	Video switch control output.
16	V-INH	–	Not used (Open).
17	LED DATA	O	LED data output.
18	LED CLR	O	LED clock signal output.
19	S. POWER	I	Power switch input.
20	RX (SIN)	–	Not used (Fixed at " L ")
21	TX (SOUT)	–	Not used (Open).
22	BUSY	–	Not used (Open).
23	FL CLEAR	O	FL reset signal output.
24	FL DATA	O	FL data output.
25	FL CLK	O	FL clock output.
26	FL LAT	O	FL latch signal output.
27	———	–	Not used (Ground).
28	VCC(A)	–	Analog power supply (+4.9V).
29	+ AVR	–	Connect to VDD (+5.1V).
30	– AVR	–	Not used (Ground).
31	GND (D)	–	Ground.
32	AD KEY IN1	I	Key input.
33	AD KEY IN2	I	Key input.
34	VSS(D)	–	Ground.
35	AD KEY IN3	I	Key input.
36	AD KEY IN4	I	Key input.
37	AD KEY IN5	I	Key input.
38	AD VERSION	I	Model select.
39	VOL +	O	Volume up control output.
40	VOL –	O	Volume down control output.
41	MODE0	–	Not used (Fixed at " H ")
42	MODE1	–	Not used (Fixed at " H ")
43	MODE2	–	Not used (Ground).
44	STANDBY	–	Connect to VDD (+5.1V).
45	STOP	O	Power ON/OFF control output.

Pin No.	Pin name	I/O	Description
46	LERNING LED	–	Not used (Open).
47	———	–	Not used (Ground).
48	———	–	Not used (Ground).
49	CTR A IN	I	Control S signal input (DE715 : US, Canadian model).
50	STANDBY LED	–	Not used (Open).
51	VOL LED	O	Volume LED drive.
52	S-OUT	O	Control S signal output (DE715 : US, Canadian model).
53	CTR A OUT	O	Control S signal output (DE715 : US, Canadian model).
54	VIDEO1 (M-BUS)	O	VIDEO1 control signal output.
55	VIDEO2 (M-BUS)	O	VIDEO2 control signal output.
56	TV (M-BUS)	O	TV control signal output.
57	——	–	Not used (Ground).
58	SP OFF IN	I	Speaker switch input.
59	SIGNAL IN	–	Not used (Ground).
60	——	–	Not used (Ground).
61	——	–	Not used (Ground).
62	RESET	I	Reset terminal.
63	V_{SS}(D)	–	Ground.
64	XO	O	System clock (4.19MHZ).
65	XI	I	System clock (4.19MHZ).
66	V_{CC}(D)	–	Digital power supply (+4.9V).
67	——	–	Not used (Ground).
68	POWER RY	O	Power relay drive.
69	BRIDGE RY	–	Power key input.
70	SUR RY	O	Surround relay drive.
71	CENTER RY	O	Center relay drive.
72	FRONT RY (H,P)	O	Front (Headphone) relay drive.
73	MIX/SUB RY	O	Woofer relay drive.
74	4/8 IN	–	Not used (Ground).
75	PROTECT IN	I	Protector operation input.
76	DIRECT PASS	O	Direct pass relay drive.
77	BASS BOOST	O	Bass boost ON/OFF control.
78	F/C/W MUTE	O	Front, Center, Woofer mute drive.
79	SL MUTE	O	Surround L-CH mute drive.
80	SR MUTE	O	Surround R-CH mute drive.

IC103 µPD780205GF-027-3BA (SYSTEM CONTROL) (STR-D560Z/DE615)

Pin No.	Pin name	I/O	Description
1	——	–	Not used (Connect to V_{DD}).
2 – 4	——	–	Not used (Connect to ground).
5	F/C/W. MUTE	O	Front, Center, Woofer mute drive.
6	SL MUTE	O	Surround L-CH mute drive.
7	SR MUTE	O	Surround R-CH mute drive.
8	AC MUTE	O	AC mute drive.
9	D LATCH	O	Data latch output.
10	RESET	I	Reset terminal.
11	X2	O	System clock (4.19MHZ).
12	X1	I	System clock (4.19MHZ).
13	VSS	–	Ground.
14	NP	–	Not used (Open).
15	——	–	Connect to reset terminal.
16	V_{DD}	–	Power supply (+5V).
17	T LATCH	O	Tuner function latch output.
18	S CLOCK	O	Serial clock output.
19	S DATA	O	Serial data output.
20	S LATCH	O	Serial latch output.
21	AUDIO. STOP	O	Tuner auto stop output.
22	TUNER MUTE	O	Tuner mute output.
23	STEREO	I	Stereo detect signal input.
24	IF DATA IN	I	IF data input.
25	GND A/D	–	Ground.
26	SIRCS	I	Remote control signal input.
27	POWER KEY	I	Power key input.
28	VERSION	I	Model select input.
29	KEY 5	I	Key input.
30	KEY 4	I	Key input.
31	KEY 3	I	Key input.
32	KEY 2	I	Key input.
33	KEY 1	I	Key input.
34	VDD A/D	–	Power supply (+5V).
35	VREF A/D	I	Reference voltage input.
36	V-A	O	Video switch control output.
37	V-B	O	Video switch control output.
38	V-E	O	Video switch control output.
39	STOP	O	Power ON/OFF control output.
40	V_{SS}	–	Ground.
41	DIRECT PASS	O	Direct pass relay drive.
42	SUR RY	O	Surround relay drive.
43	CENTER RY	O	Center relay drive.
44	FRONT RY	O	Front relay drive.
45	MIX SUB RY	O	Woofer relay drive.

Pin No.	Pin name	I/O	Description
46	V_{DD}	–	Power supply (+5V).
47	PROTECTOR IN	I	Protector operation input.
48	POWER RY	O	Power relay drive.
49	BASS BOOST	O	Bass boost ON/OFF control.
50	SP OFF	I	Speaker switch input.
51	VOL –	O	Volume down control output.
52	VOL +	O	Volume up control output.
53	VOL LED	O	Volume LED drive.
54	STANDBY LED	–	Not used (Open).
55	———	–	Not used (Open).
56	BASS BOOST LED	O	BASS BOOST LED drive.
57	5.1 INPUT LED	O	5.1 INPUT LED drive.
58	DIRECT PASS LED	O	DIRECT PASS LED drive.
59	SUR LED	O	SUR LED drive.
60	TONE LED	O	TONE LED drive.
61	VIDEO 1 LED	O	VIDEO 1 LED drive.
62	INDEX LED	O	INDEX LED drive.
63	PHONO LED	O	PHONO LED drive.
64	TUNER LED	O	TUNER LED drive.
65	DAT MD LED	O	DAT/MD LED drive.
66	CD LED	O	CD LED drive.
67	TAPE LED	O	TAPE LED drive.
68	TV/DBS LED	O	TV/DBS LED drive.
69	VIDEO2 LED	O	VIDEO2 LED drive.
70 – 78	P1 – P9	O	FL segment drive.
79	V LOARD	–	FL power supply (– 35V).
80 – 87	P10 – P17	O	FL segment drive.
88 – 100	G1 – G13	O	FL segment drive.

2-2. CIRCUIT BOARDS LOCATIONS