

General

The model 22AC441 is a 2-band AM car radio receiver incorporating provision for the playback of cassette tapes and featuring automatic search facilities with LCD digital display of frequency. Four buttons are fitted for the selection of pretuned programmes. Sockets are provided for the connection of front R, front L, rear R and rear L loudspeakers. The unit operates from a car battery supply and provision is made for the fitting of an internal back-up battery.

Power supply
14.4V DC

RESISTORS		
R1200	100k	B2
R1201	100k	B2
R1202	100k	B2
R1203	47k	B1
R1204	47k	B1
R3200	4k7	B2
R3201	5k1	B1
R3203	4k7	B1
R3208	56k	B2
R3209	150k	B2
R3213	820	B2
R3214	330	B2
R3217	560k	B2
R3224	22k	B2
R3225	22k	B2
R3228	10k	B2
R3229	10k	B2
R3230	4k7	B2
R3231	4k7	B2
R3250	5k6	A2
R3251	100k	A2
R3254	1M	A2
R3255	2k2	A2
R3256	220	A2
R3259	1M	A2
R3260	150	A2
R3261	560k	A2
R3262	6k8	B1
R3264	330k	A2
R3265	39k	A2
R3268	220	A2
R3269	100k	A2
R3271	1k5	B2
R3272	4k7	B2
R3273	22	A2
R3274	390	B2
R3275	560	A2
R3276	3k3	B2
R3277	100	A2
R3278	2k2	B2
R3279	75k	A2
R3281	24k	A1
R3282	150k	A2
R3283	240k	A2
R3284	22k	A2
R3293	33k	A2
R3294	33k	B1
R3305	270	A1
R3306	24k	A2
R3307	180	A1
R3310	27k	A2
R3311	27k	A2
R3312	27k	A2
R3315	51k	A2
R3316	1k	B1
R3323	270	B1
R3324	5k6	B2
R3325	5k6	B1
R3600	220	E1
R3601	220	E1
R3602	22	E1

CAPACITORS		
C2201	4u7 63V	B2
C2202	22n	B1
C2206	0u47 63V	B2
C2220	4u7 63V	B2
C2226	10n	B2
C2227	10n	B2
C2228	100n	B2
C2229	100n	B2
C2251	10n	A2
C2252	2n7	A2
C2253	20p	A2
C2254	100p	A2
C2255	1n5	A2
C2256	100p	A2
C2257	40p	A2

Fuse

FS1600: 2.5A (T) (accessible from back of casing)

Transistors

TR6209	ON796
TR6212	BF410D
TR6213	BF410A
TR6214	BC549C
TR6224	BD137
TR6225	BC548
TR6226	BC549C

Diodes

D6235	BA315
D6236-7	BZX79/C6V6
D6238	BA317
D6242	BA315
D6245	BA317
D6246	BZX79/B4V7
D6247	1N4001
D6248	BZX79/B9V1
D6249	BZX79/C5V6
D6250-1	BA317

Integrated circuits

IC6201	TDA1510
IC6202	TDA1072
IC6203	SAA1057
IC6204	MC3302N
IC6205	TDA1510

Dial Lamps

1211-2	50mA 18V
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Waveband coverage

MW:	522-1611kHz
LW:	145-262kHz

Sensitivity

Better than 180uV for 26dB S/N ratio.

Tone control range

Bass:	±6dB at 125Hz
Treble:	±14dB at 10kHz

Audio output

4 x 5.2W ±1dB at 4 ohms.

Intermediate frequency

468kHz

Cassette player

Tracks: 2 x 2
Wow and flutter: Not more than 0.3%
Crosstalk: Not less than 30dB

Manufacturer

Philips Electronics, City House, 420-430 London Road, Croydon, Surrey CR9 3QR.

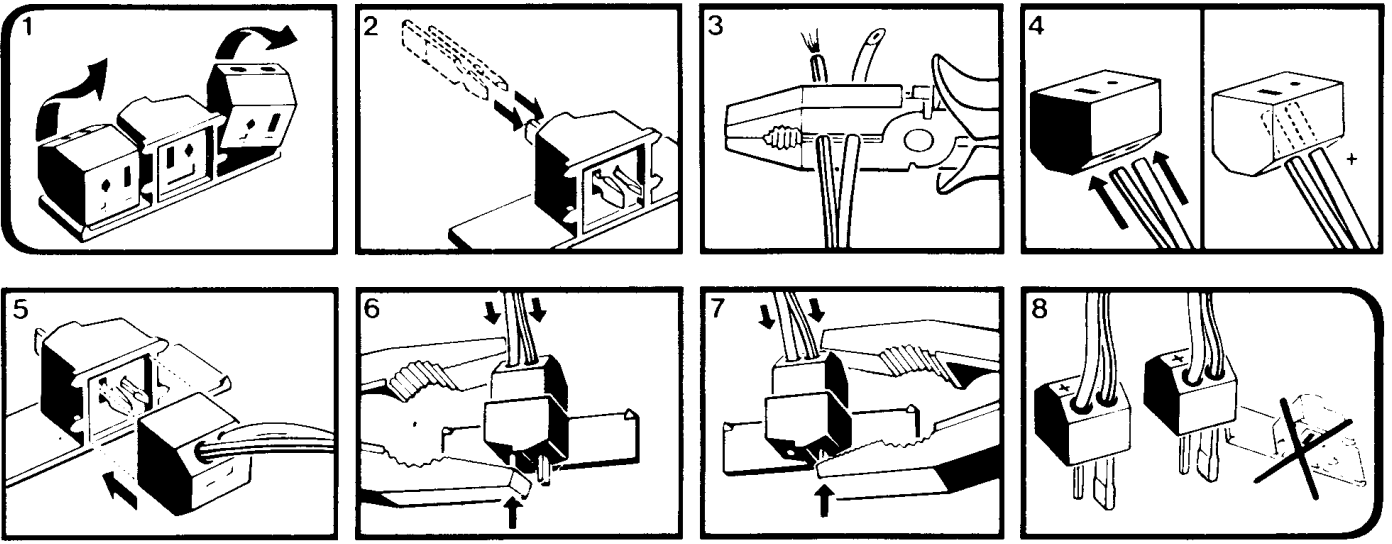
Tel: 01-689 2166

Service department

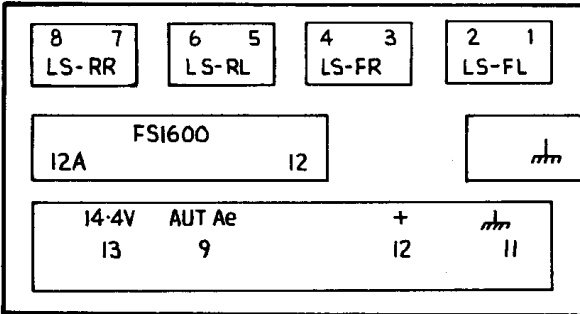
Philips Service, 604 Purley Way, Waddon, Croydon, Surrey CR9 4DR. Tel: 01-686 0505.

C2258	2u2 100V	A2	C2279	10u 50V	B2
C2259	33n	A2	C2287	10n	A2
C2260	10u 50V	A2	C2288	22n	A2
C2261	10n	A2	C2289	680p	A2
C2262	10n	A2	C2290	150n	A2
C2263	430p	A2	C2291	150u 16V	A1
C2264	40p	A2	C2293	10n	A1
C2265	100n	A2	C2294	2n2	A1
C2266	390p	A2	C2295	33p	A1
C2267	20p	A2	C2296	33u 16V	A2
C2268	22n	B2	C2297	22n	A1
C2269	18p	A2	C2298	47u 10V	A1
C2270	22n	A2	C2301	33p	B1
C2271	120p	B2	C2302	33p	B1
C2272	120p	B2	C2303	22n	B1
C2273	22n	A2	C2304	2n2	A2
C2274	220u 10V	A2	C2305	47u 10V	B1
C2275	4n7	B2	C2306	10n	B1
C2277	0u47 63V	B2	C2307	10n	B1
C2278	2u2 63V	B2	C2316	11n	B1

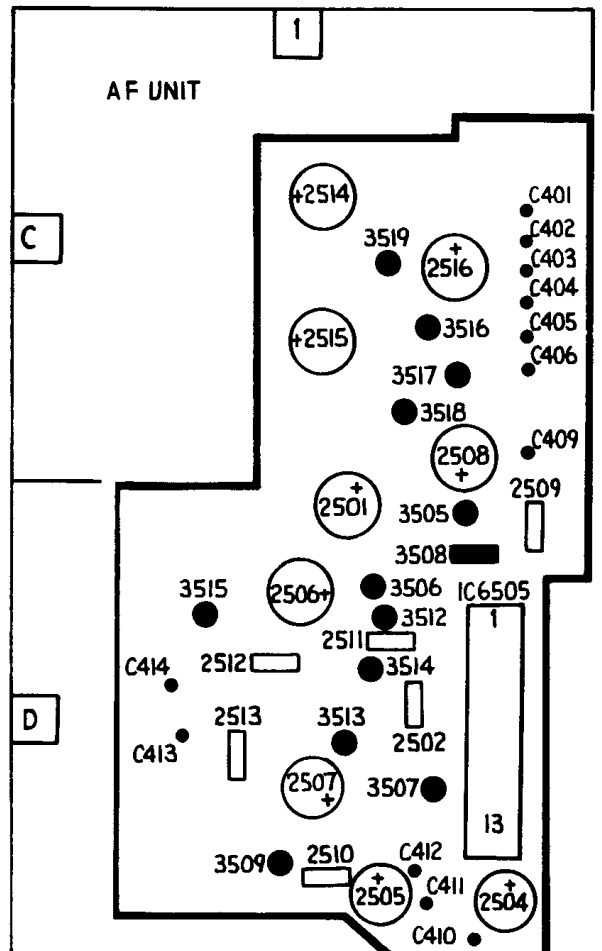
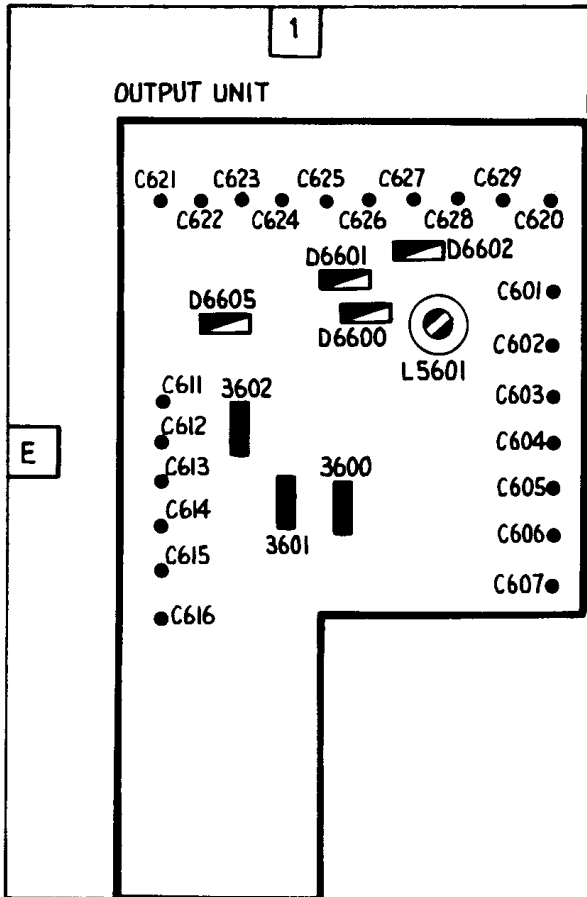
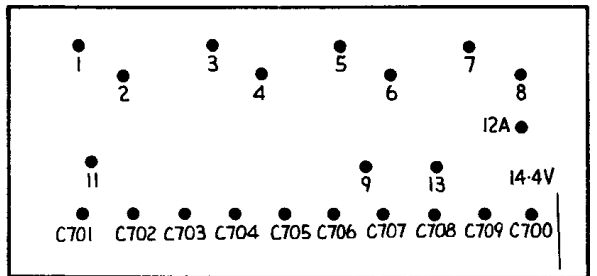
LS PLUGS



OUTPUT UNIT (TOP)



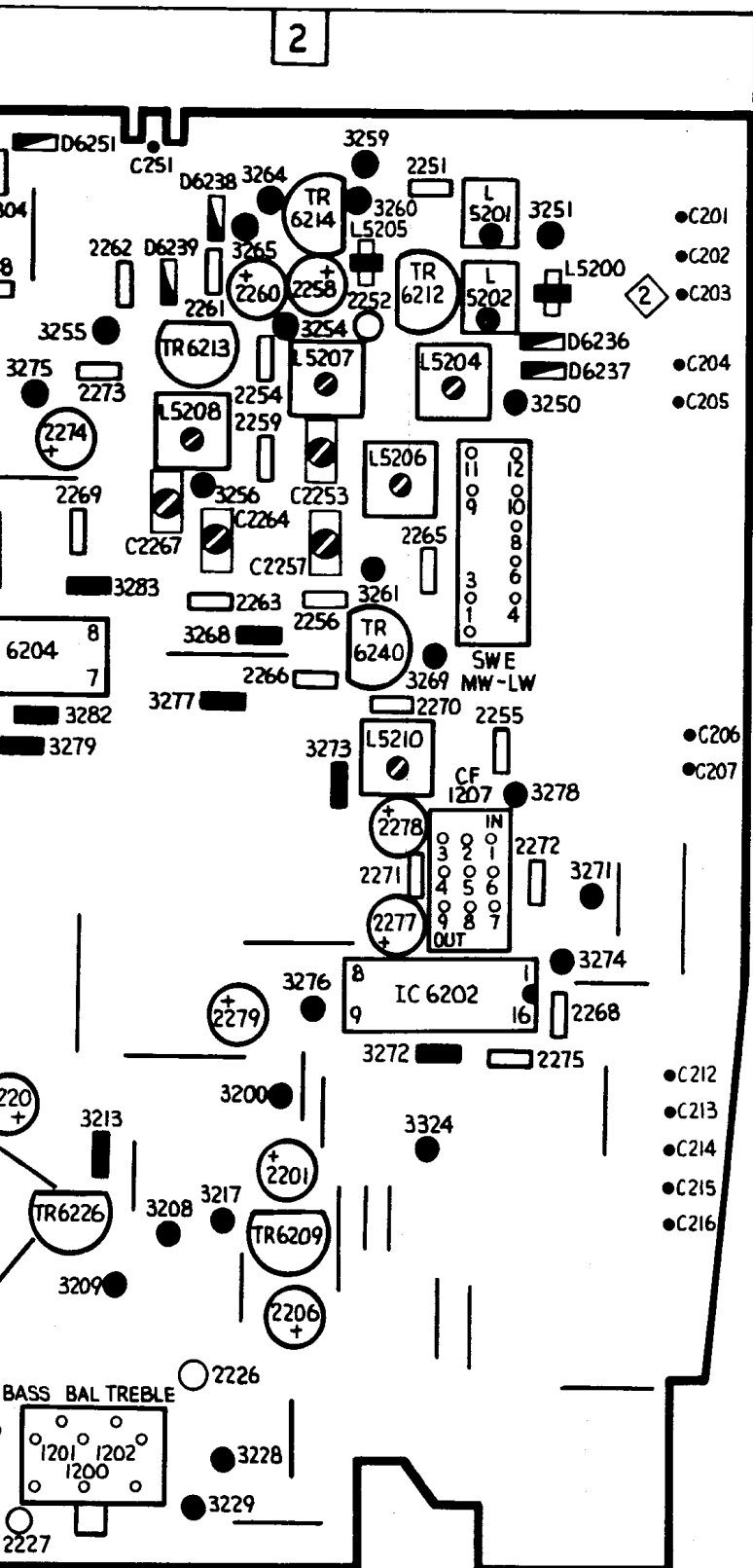
OUTPUT UNIT (BOTTOM)



PS 22AC441

Cassette car radio

(Part 2)



Service notes

Supply

One of the supply voltages of the tuner unit is routed through the tape deck. If the tape deck has not been connected, A22/5 (+5, 9.2V) should be connected to the +3 line (8.5V) to make measurements and adjustments.

Service test programme

This procedure consists of three sections: (1) RAM test, (2) I/O test, and (3) LCD test. Details are as follows:

(1) Switch off the receiver, press button P3 and switch the receiver on while the button is kept depressed. The microchip in the tuner control unit is then testing the RAM. If there are no faults, the LCD display will indicate "188.85", otherwise "INFO" will appear.

Alignment

Equipment required

- (1) AM signal generator
- (2) Oscilloscope
- (3) High impedance voltmeter

IF alignment

Connect signal generator to test point A (aerial input). Connect voltmeter to test point 1 (C706 on output unit). Switch receiver to MW band and depress selector button P1.

Inject a signal of 522kHz, AM 30% at 1000Hz, and adjust the core of L5210 for maximum reading on voltmeter.

RF alignment

Transfer voltmeter to test point 2 (pin 6 of IC6203). Signal generator should be connected to test point A throughout the following alignment steps and switched to 30% modulation at 1kHz.

With the receiver switched to MW and with button P1 depressed, inject a signal of 522kHz and adjust the core of L5208 to obtain a reading of 500mV on voltmeter. Depress button P4, inject a signal of 1611kHz and adjust C2267 to obtain a reading of 8V on voltmeter.

Switch receiver to LW band, inject a signal of 262kHz and, with button P4 depressed, adjust C2264 for a reading of 8V on voltmeter. Inject a signal of 145kHz, depress button P1 and check that voltmeter reading is 500mV.

Transfer voltmeter to test point 1 (C706 on output unit). Switch receiver to MW band and depress button P2. Inject a signal of 648kHz and adjust the core of L5207 for maximum reading on voltmeter. Depress button P3, inject a signal of 1494kHz and adjust C2253 for maximum reading on voltmeter.

Switch receiver to LW band and select button P2. Inject a signal of 175kHz and adjust the core of L5206 for maximum reading on voltmeter. Select button P3, inject a signal of 250kHz and adjust C2257 for maximum reading on voltmeter.

AM search

Connect oscilloscope to test point 7 (C310/510 on tuner control unit). Inject a signal of 1494kHz, unmodulated, at 500µV level and depress button P3. Adjust preset resistor R3284 and check display for waveform shown in the diagram.

Notes

The preceding alignment steps should be repeated in sequence to obtain optimum results.

The buttons P1-P4 select preprogrammed frequencies, which should first be checked as outlined in the previous section.

Specification checks

Signal-Noise ratio

Connect AM signal generator to test point C. Connect voltmeter to test point 1. Select MW band. Inject a signal of 600kHz, 30% AM at 1000Hz, at a level of 180 μ V. Tune in the signal digitally.

Adjust the receiver volume control to obtain a reading on the voltmeter of 2V (= 1 watt). Set this reading to reference level (0dB). Switch off the modulation from the test signal, leaving the input level unaltered. The meter should then give a reading of -26dB.

Switch the receiver to the LW band. Inject a signal of 175kHz, 30% AM at 1000Hz, at a level of 200 μ V. Depress the P2 button. Adjust the volume control to obtain a reading on the meter of 2V (= 1W). Set this reading to 0dB.

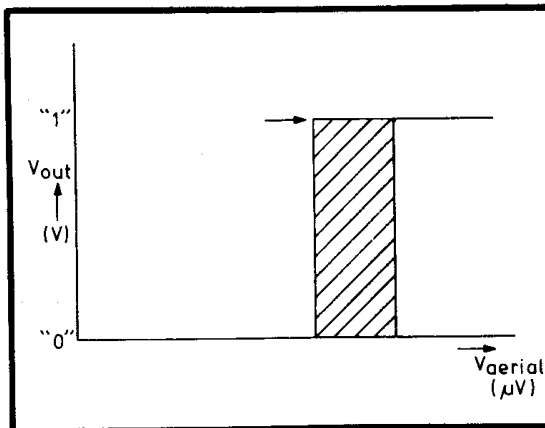
Switch off the modulation from the test signal, leaving other controls unaltered. The meter should then give a reading of -26dB.

Aerial sensitivity check

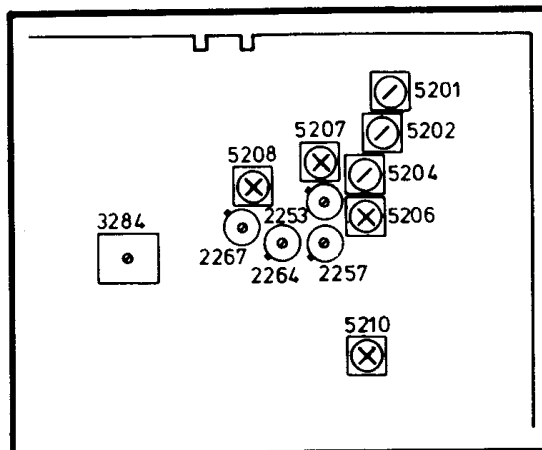
With the signal generator connected to test point A (aerial input), inject a signal of 1494kHz, 30% AM at 1000Hz, at a level of 22 μ V. Turn volume control to maximum and depress the P3 button. The reading on the meter (connected as for S/N ratio checks) should be 2V at the input level specified.

Switch the receiver to the LW band and inject a signal of 250kHz, 30% AM at 1000Hz, at a level of 32 μ V. With button P3 depressed and volume control at maximum the meter reading should be 2V.

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AM search alignment



Location of cores and trimmers

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Exploded view of complete assembly

