

ICF-24

SERVICE MANUAL

Ver 1.1 2002.08

US Model
Canadian Model
E Model
East European Model



Photo: US, Canadian model

SPECIFICATIONS

Frequency range:

FM: 87.6—108MHz (US, Canadian, E model)
65—108MHz (East European model)
AM: 530—1,710kHz

Speaker: Approx. 7.7 cm (3 inches) dia., 4 Ω

Power output: 350 mW (at 10% harmonic distortion)

Output: Headphones jack (stereo minijack)

Power requirements: 120 V AC, 60 Hz with the equipped AC power cord (US, Canadian, E92 model)
220—230V AC, 50Hz with the equipped AC power cord (East European, E91 model)
6 V DC with four size AA (R6) batteries

Battery life:

Approx. 26 hours
(for four hours a day at normal volume using Sony batteries SUM-3 (NS))

Dimensions:

Approx. 217 × 117 × 80 mm (w/h/d)
(8 5/8 × 4 5/8 × 3 1/4 inches) incl. projecting parts with the carrying handle pushed in.

Mass:

Approx. 730 g (1 lb 10 oz) incl. batteries (EXCEPT E)
Approx. 760 g (1 lb 10 oz) incl. batteries (E)

Design and specifications are subject to change without notice.

• Abbreviation

E91: 220 V AC area in E model
E92: 120 V AC area in E model

Features

- 2 way power AC/DC operation
- TUNE indicator which lights during radio reception
- Carrying handle

FM/AM RADIO

9-959-247-13
2002H0400-1
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Sony Corporation
Personal Audio Company
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SONY®

SAFETY CHECK-OUT (US Model)

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 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-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 0.75 V, 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)

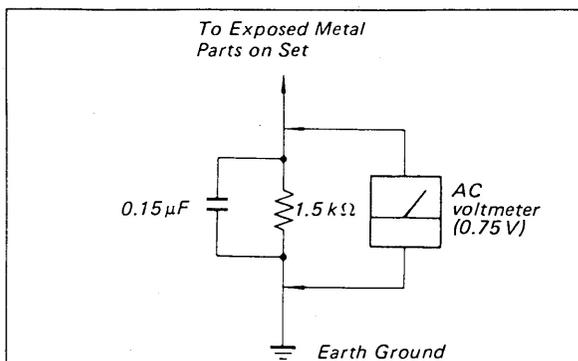
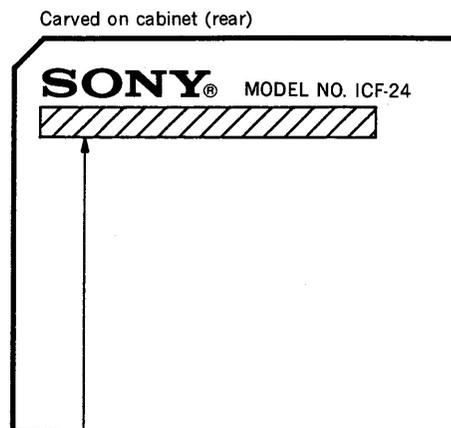


Fig. A. Using an AC voltmeter to check AC leakage.

MODEL IDENTIFICATION

—Model Number label—



US, GND, E92 model : AC : 120V~60Hz 4W
 EE, E91 model : AC : 220—230V~50Hz 4W

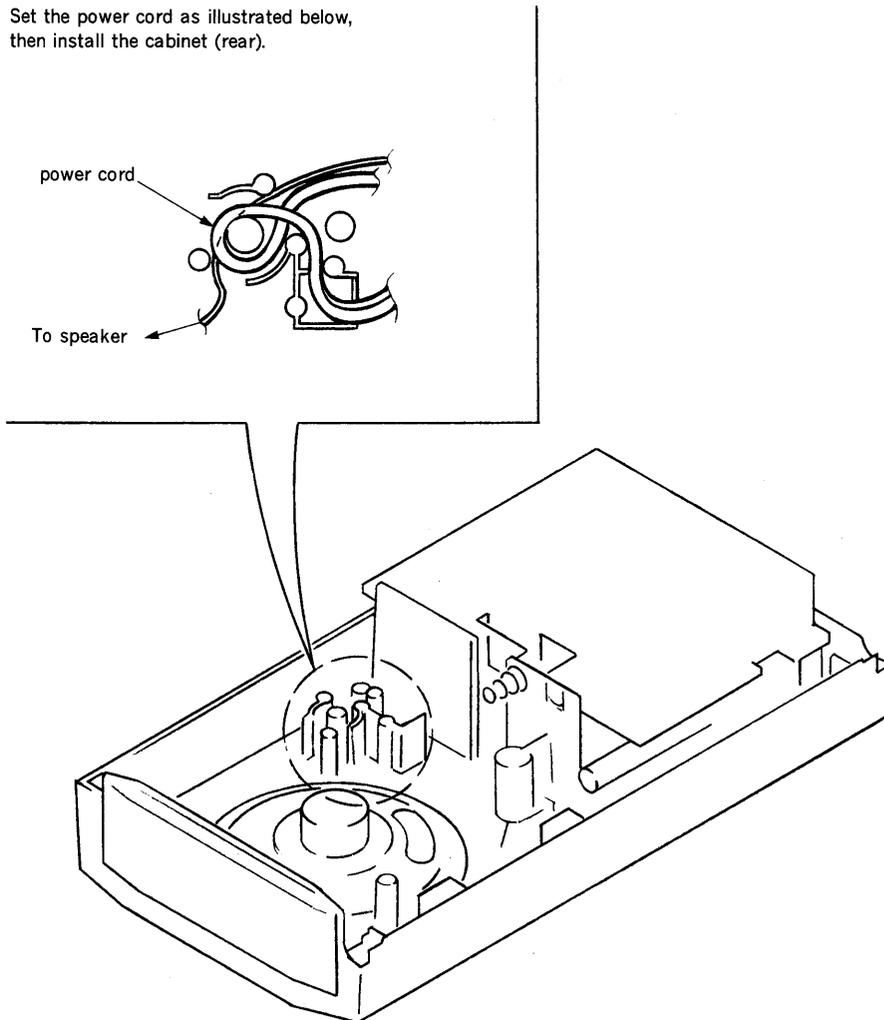
• Abbreviations

GND : Canadian model
 E91 : 220 V AC area in E model
 E92 : 120 V AC area in E model
 EE : East European model

SECTION 1 SERVICE NOTE

1-1. SETTING THE POWER CORD

Set the power cord as illustrated below,
then install the cabinet (rear).

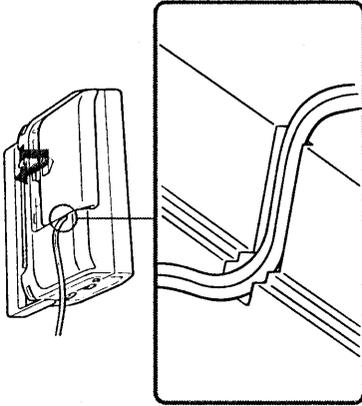


SECTION 2 GENERAL

This section is extracted from instruction manual.

Using the AC power cord

When you use the AC power cord, set it into the groove properly, then push the lid of the compartment and slide it in the direction of the arrow to close the compartment properly.



Playing the Radio

1. Slide **POWER to ON** to turn on the radio and adjust **VOL** (volume).
2. Select **FM or AM** and tune in to a station using **TUNE** (tuning).

- To turn off the radio, slide **POWER to OFF**.
- To improve radio reception
FM: Extend the telescopic antenna and adjust the length, direction and angle for the best reception.

AM: Rotate the unit horizontally for optimum reception. A ferrite bar antenna is built into the unit.

- (headphones) jack (right side of rear cabinet) plugged into the headphones jack, it automatically silences the radio speaker and the listener can enjoy complete privacy.

The jack is designed to be used for the stereo headphones with your monaural radio, but reception will be heard in monaural only.

- **TUNE** (tuning) indicator
The indicator lights up when a station is tuned in.

Notes

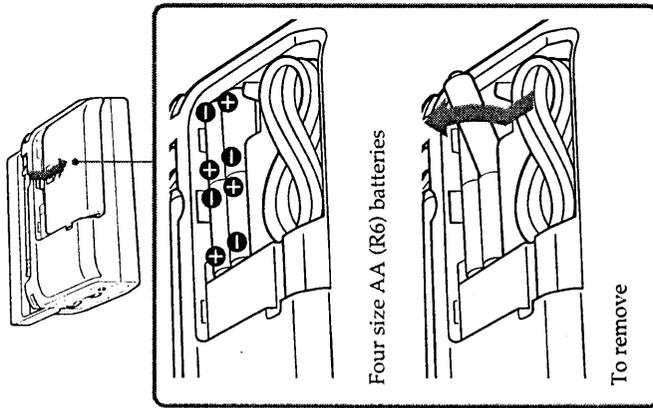
- In vehicles or buildings, radio reception may be difficult or noisy. Try listening near a window.
- Keep the radio away from metallic objects.

Installing the Batteries

For battery operation, this unit needs four size AA (R6).

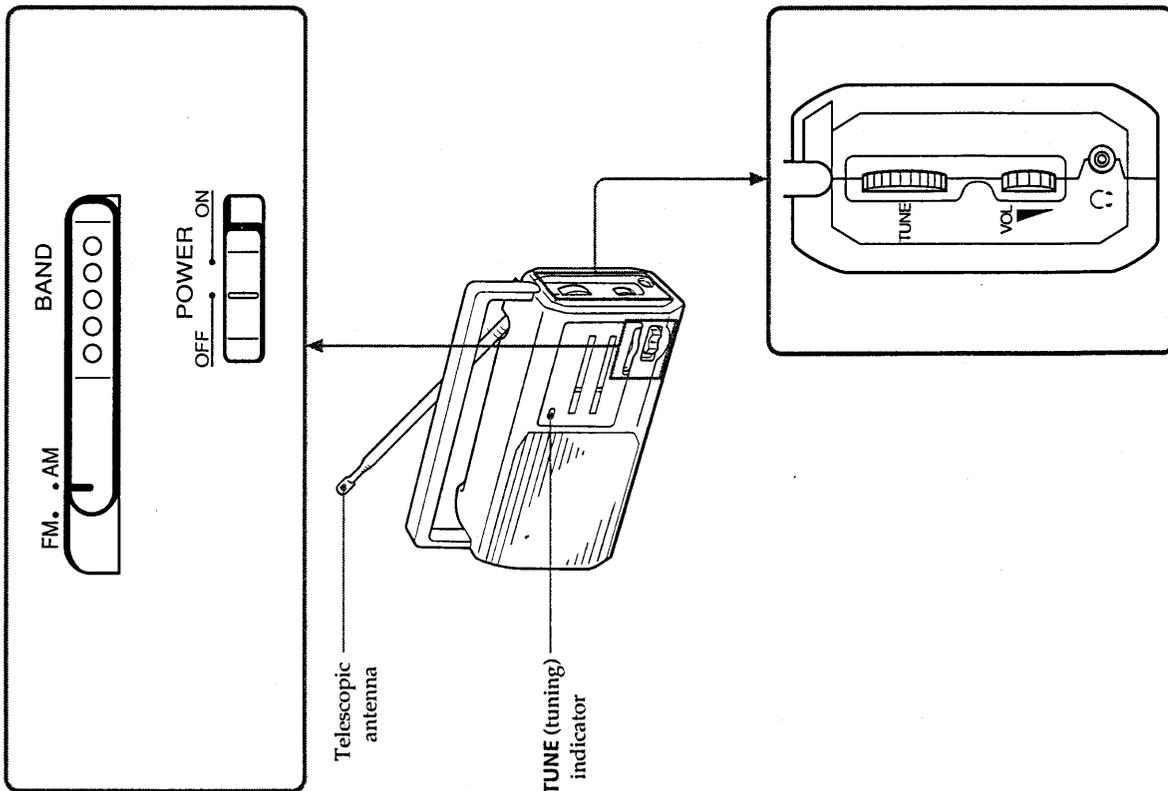
Rear

Battery and AC power cord compartment



Knowing When to Replace the Batteries

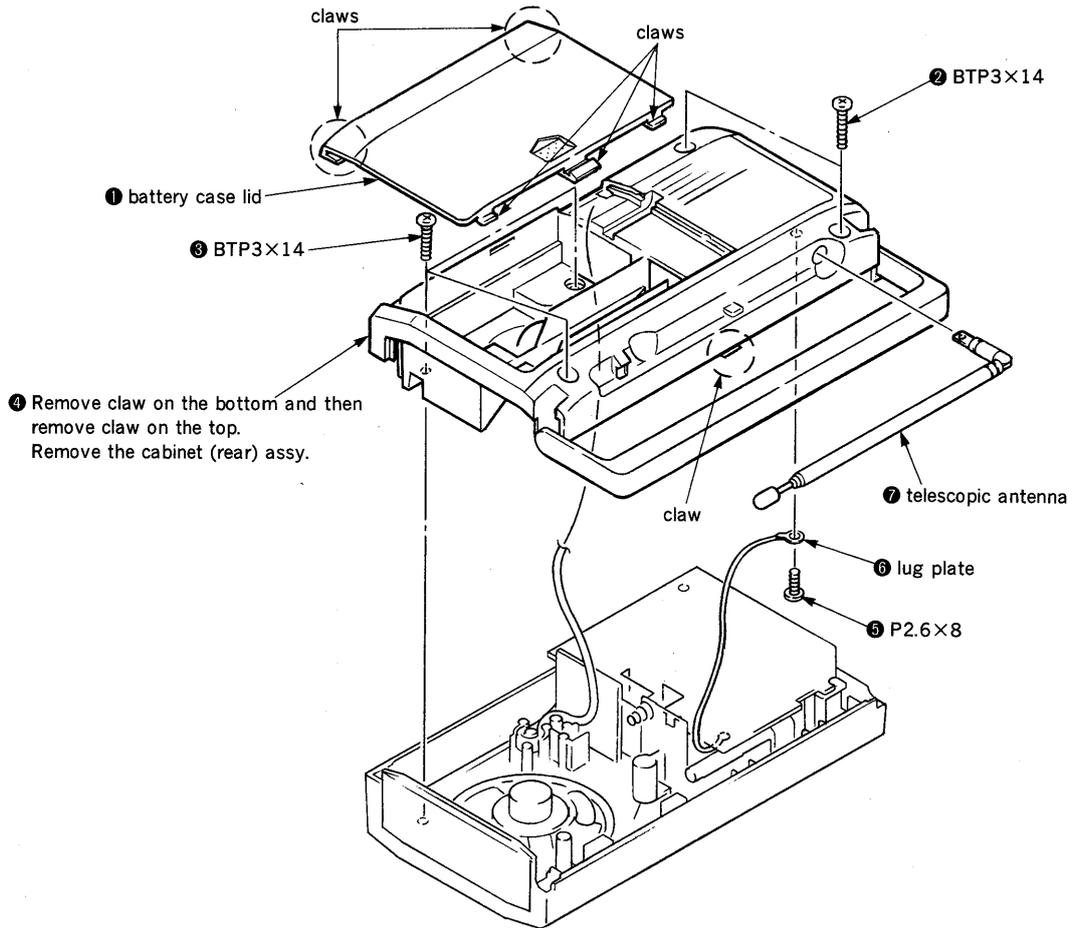
When the sound becomes weak or distorted, replace all the batteries with new ones. Concerning battery life, see "Specifications".



SECTION 3 DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

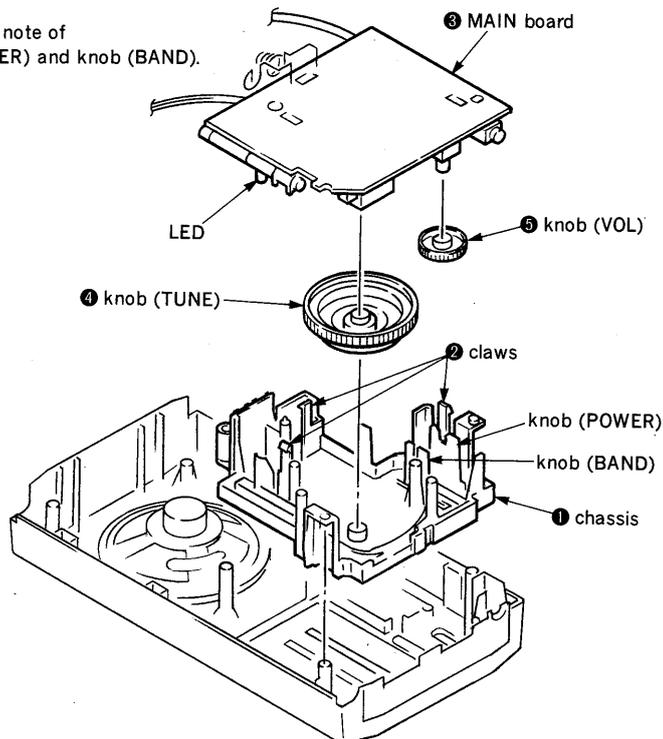
3-1. CABINET (REAR) ASSY



3-2. MAIN BOARD

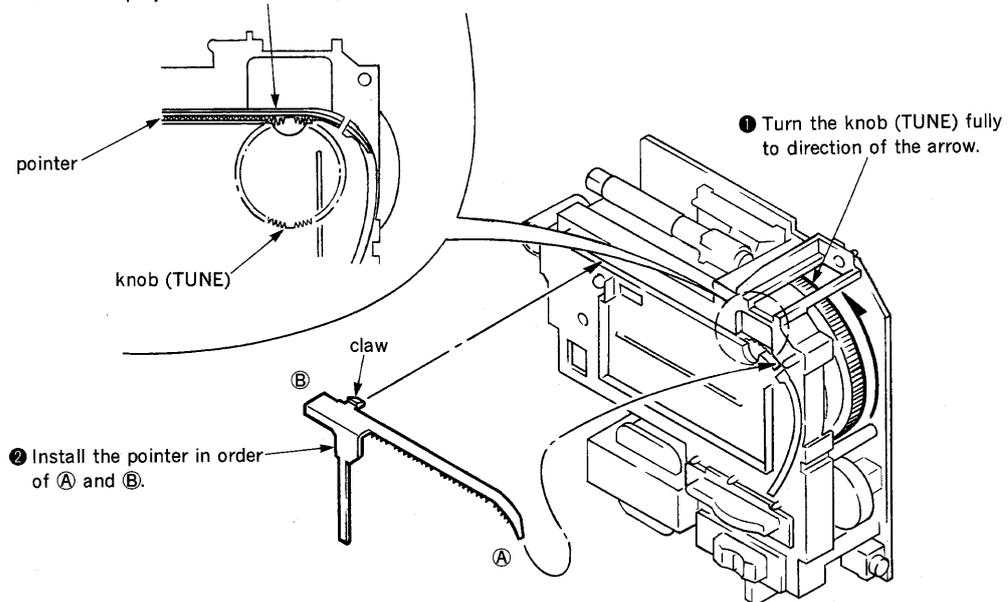
Note for Installation :

When installing the main board, take note of the positions of the LED, knob (POWER) and knob (BAND).



3-3. POINTER SETTING

When installing the pointer, the depression on it should be matched with the projection on the knob (TUNE).

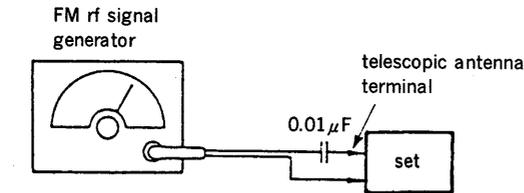


SECTION 4 ELECTRICAL ADJUSTMENTS

● FM Section

Setting :

BAND switch: FM



22.5kHz frequency deviation by 400Hz signal
output level: as low as possible

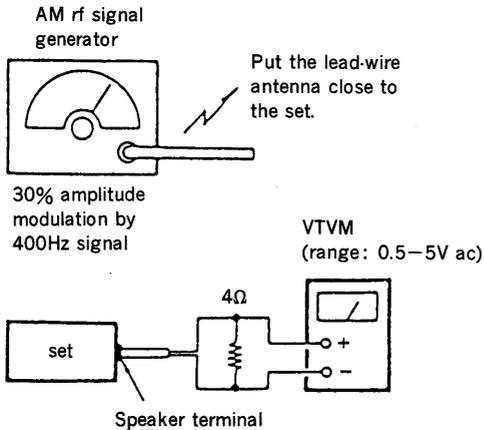
FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L3	CT3
86.5MHz (64.0MHz)	109.5MHz

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L2	CT2
86.5MHz (64.0MHz)	109.5MHz

● AM Section

Setting :

BAND switch: AM



30% amplitude modulation by 400Hz signal

VTVM (range: 0.5-5V ac)

Speaker terminal

AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L4	CT4
520kHz	1,750kHz

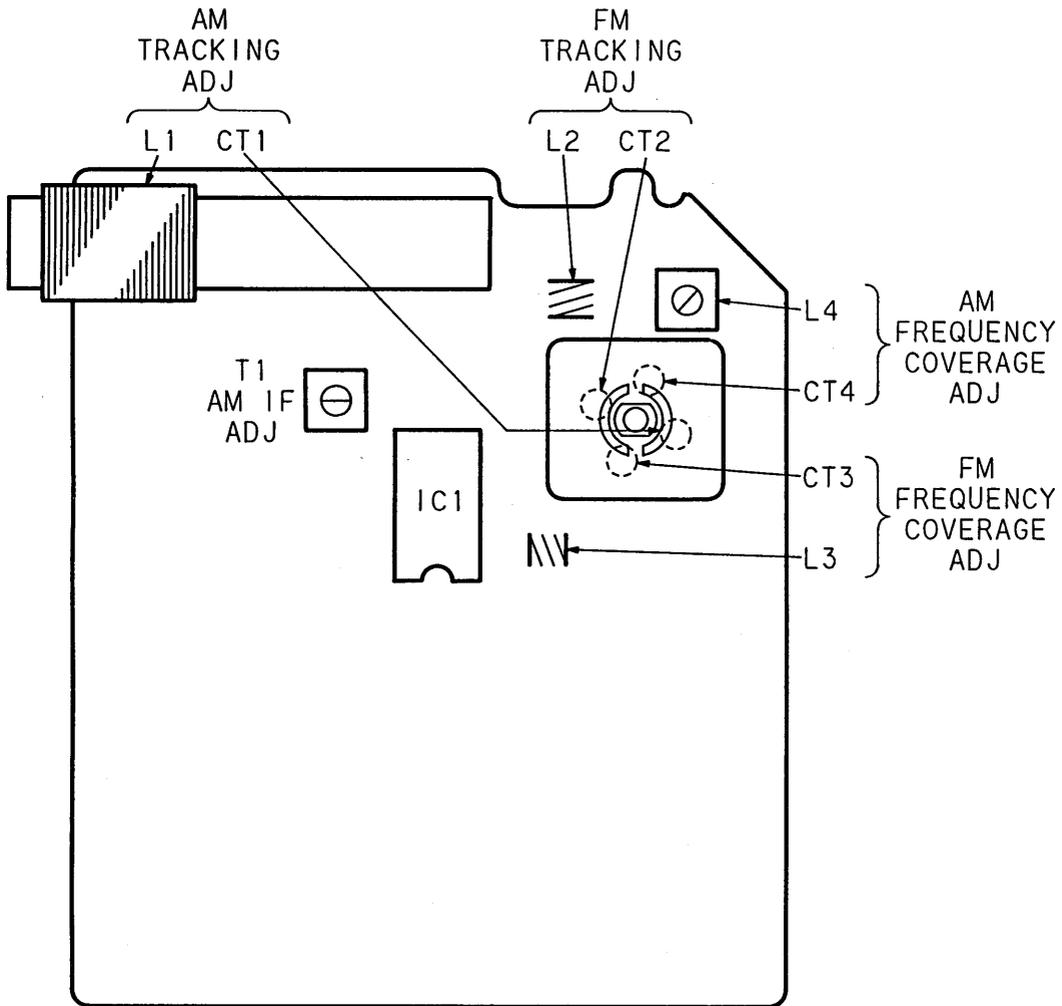
AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L1	CT1
600kHz	1,400kHz

AM IF ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
T1	
455kHz	

() : East European model

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- Remove telescopic antenna in FM section adjustments.

Adjustment Location : main board (component side)



SECTION 5
DIAGRAMS

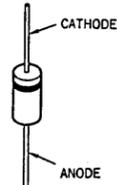
5-1. SEMICONDUCTOR LEAD LAYOUTS

CXA1019S

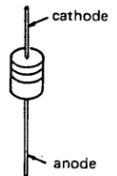


(Top view)

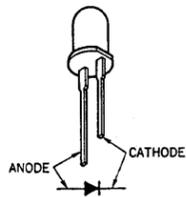
1N4002L



1SS133



LN21RPL



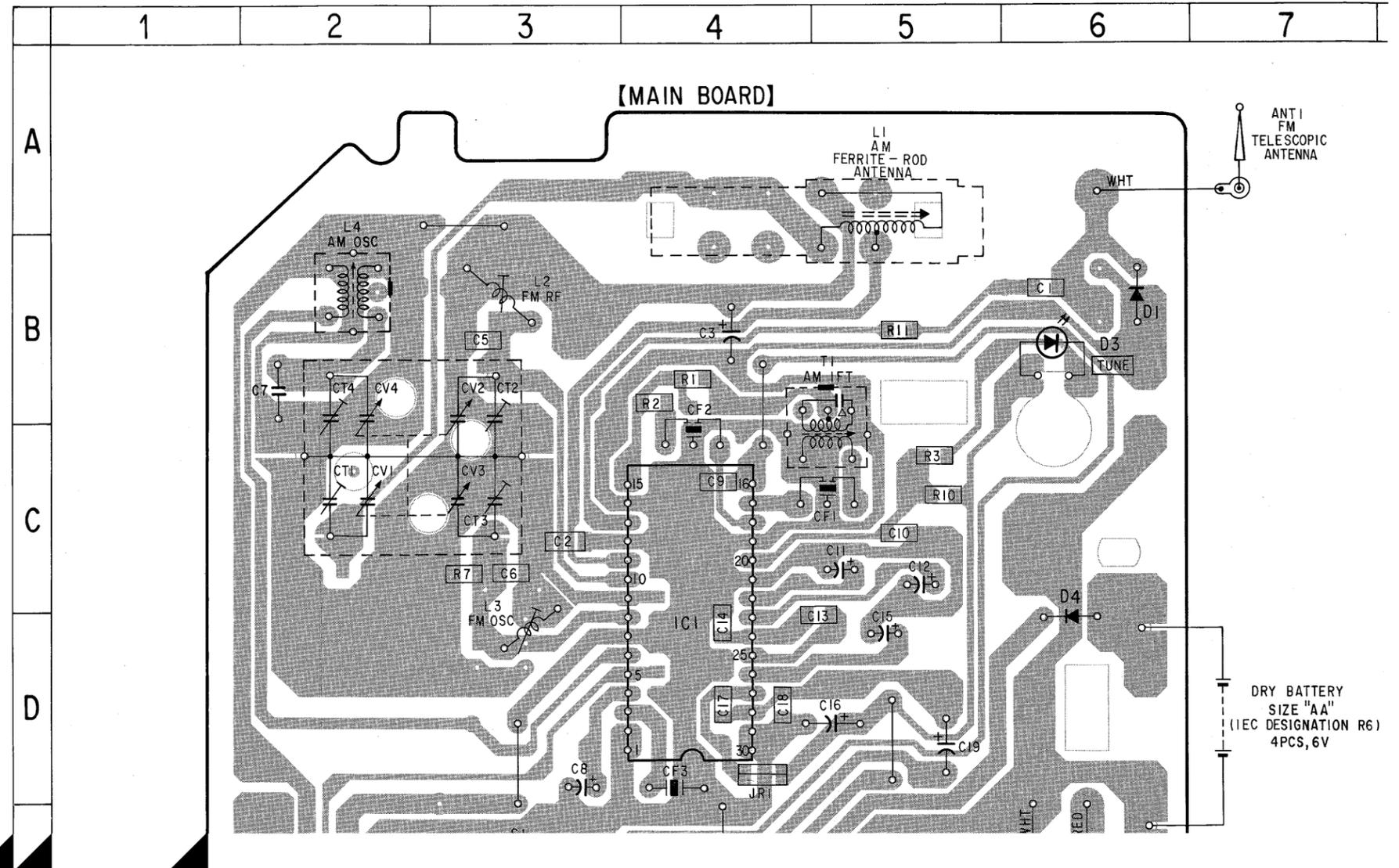
• Semiconductor Location

Ref. No.	Location
D1	B-6
D3	B-6
D4	C-6
D5	F-4
D6	F-3
IC1	C-4

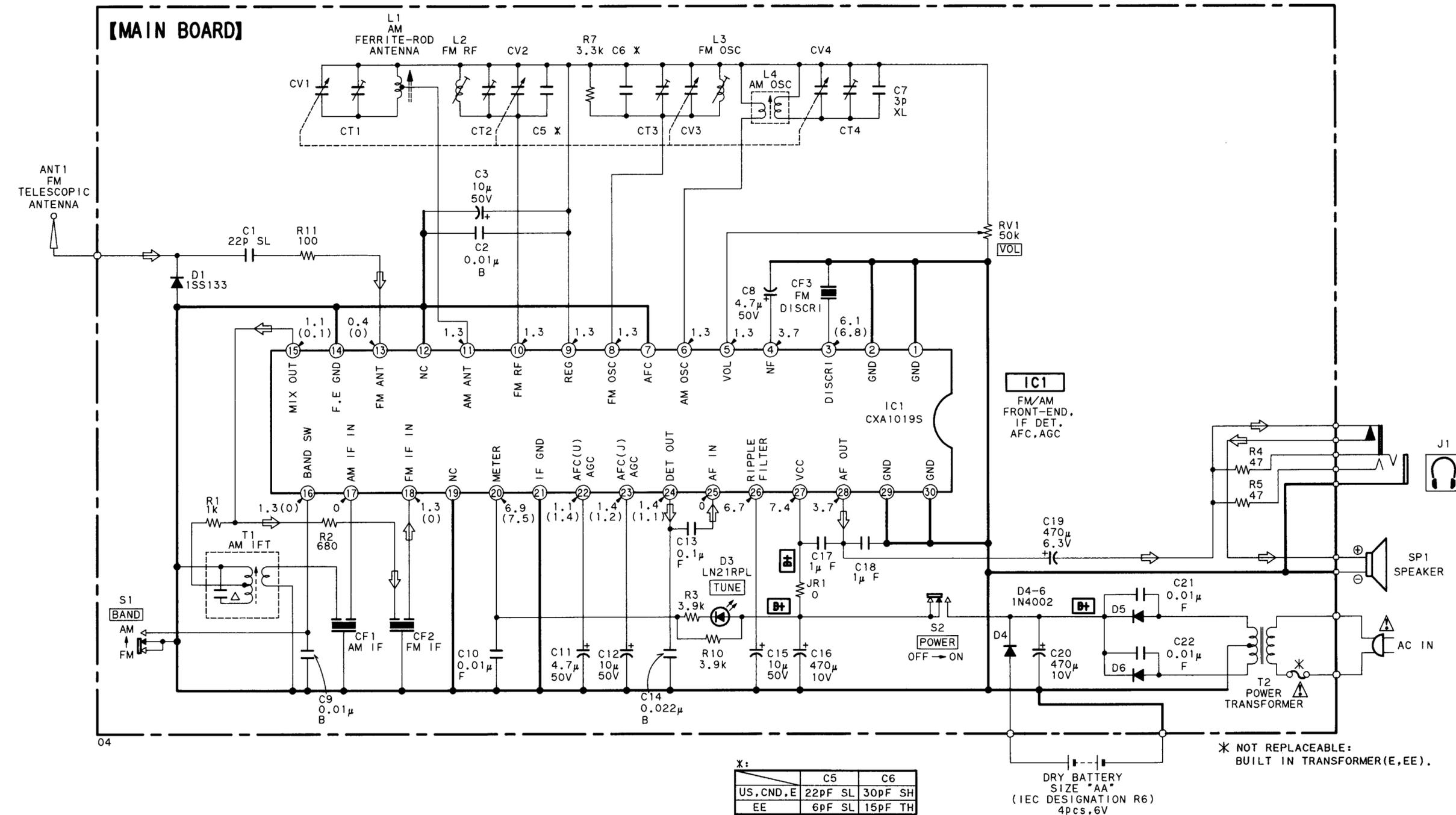
Note:

- : parts extracted from the component side.
- : indicates side identified with part number.
- : Pattern on the side which is seen.

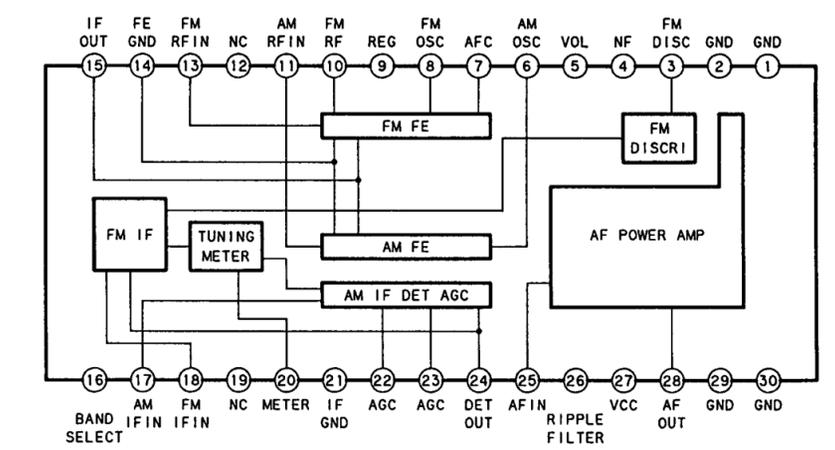
5-2. PRINTED WIRING BOARD



5-3. SCHEMATIC DIAGRAM



• IC Block Diagram
IC1 CXA1019S



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

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

Note:
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- B+ : B+ Line
- Voltage is dc with respect to ground under no-signal (detuned) conditions.
- no mark: FM
- () : AM
- Voltages are taken with a VOM (Input Impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- \Rightarrow : FM

• Abbreviations
CND : Canadian model
EE : East European model

MAIN

Ref. No.	Part No.	Description	Remark
R11	1-216-025-00	METAL CHIP	100 5% 1/10W
		< VARIABLE RESISTOR >	
RV1	1-241-542-11	RES, VAR, CARBON 50K (VOL)	
		< SWITCH >	
S1	1-571-478-11	SWITCH, SLIDE (BAND)	
S2	1-692-843-11	SWITCH, SLIDE (POWER)	
		< TRANSFORMER >	
T1	1-404-790-11	TRANSFORMER, IF	
T2	1-423-878-11	TRANSFORMER, POWER (US Condition)	

Printing Method for Large Sized Documents Such As Circuit Diagrams

Printing the page that exceeds A4-size two pages (or letter size) is possible by specifying the print range. (Acrobat Reader Version 4.0 or later)

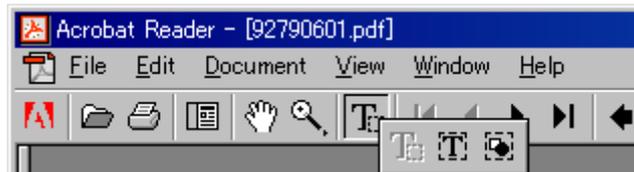
1. The enlarged print is made, if a smaller range than A4 size is specified and the A4 size is selected as a print paper.
2. Almost real sized print is made, if the range is specified, meeting the print paper size.
3. The reduced print is made, if a larger range than the print paper size is specified.

Printing by Specifying a Range

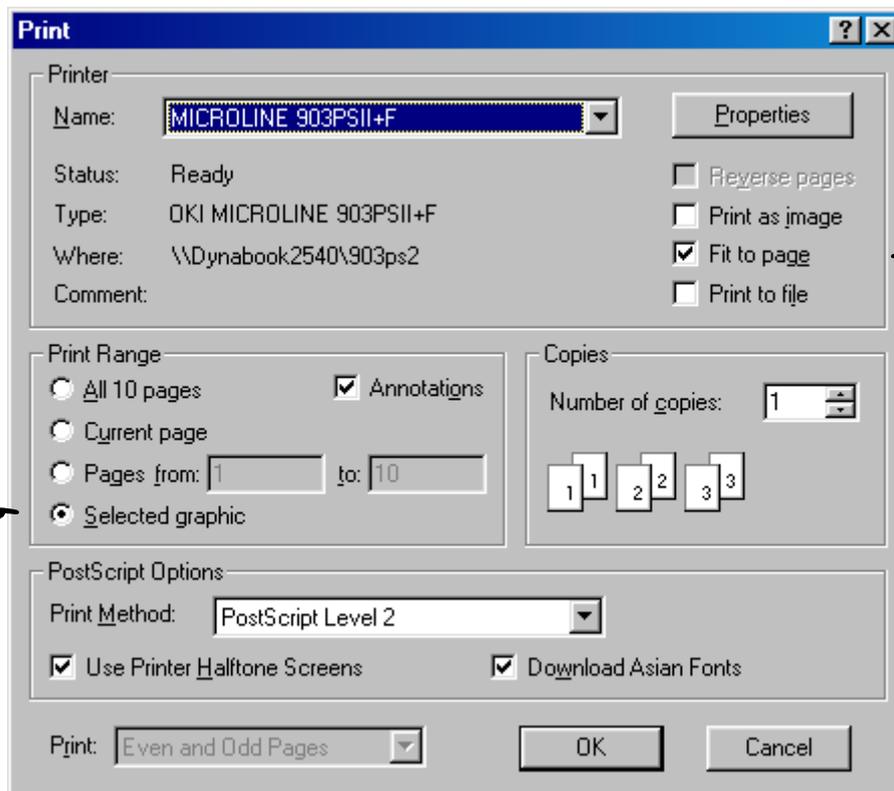
In printing out the drawings such as a schematic diagram and a printed wiring board larger than the printed paper size, they can be printed by specifying the range. (Acrobat Reader Version 4.0 or later)

1. Display the page to be printed.
2. From the File menu, select [Page Setup] and set the paper size.
3. From the Command bar, select [Graphic Select Tool].

(Keep pressing  , select )



4. Dragging the cursor, enclose the range on the page to be printed.
5. From the File menu, select [Print] and make sure that the [Selected Graphic] is already checked. Also, if [Fit to page] is checked, the selected range is enlarged or reduced (and rotated as necessary) meeting the paper size.



6. To cancel the printed range, click an arbitrary position on the screen.

