

## ■ OPERATING MANUAL

### MODEL

- MF-800M: Amplifier; Metal Case
- MF-800W: Amplifier; Wood Case

# ULTRA MOTIONAL STEREO HI-FIDELITY

## MOTIONAL FEEDBACK (MFB) SPEAKER-AMPLIFIER SYSTEM

- MODEL · EA-801 Amplifier; Metal Case (ONE UNIT)  
· EA-802 Amplifier; Wood Case

- MODEL · EASB-8M2 SPEAKER SYSTEM (TWO UNITS)

This system is transformer operated.

Do not operate on direct current.

Read This Operating Manual Completely Before Installing.



MATSUSHITA ELECTRIC CORPORATION OF AMERICA

PAN-AM BUILDING

200 Park Avenue

New York 17, New York

PANASONIC

OPERATION MANUAL FOR THE MOTIONAL FEEDBACK SPEAKER-AMPLIFIER SYSTEM  
MODEL MF-800

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## MODEL MF-800

### MOTIONAL FEEDBACK (MFB) SPEAKER-AMPLIFIER SYSTEM

#### THE NEW MFB SYSTEM :

The MF-800 is a newly developed speaker-amplifier combination which uniquely utilizes a new variable ACCELERATION-VELOCITY type motional feedback system. This system features adjustable damping and frequency response in the low frequency range of the speaker by using a differential circuit in the feedback loop. The MF-800 consists of an amplifier and two speaker systems, each system mounted in its own enclosure. Each channel of the amplifier, Model EA-801 or EA-802 consists of two 6BQ5(7189) tubes connected push-pull in the output stage ; one half 12AX7, pre-amp.; one dual triode, 12AX7, amplifiers; one half 6AN8 driver; one half 6AN8 phase inverter. Each speaker system, Model EASB-8M2, is a three way system consisting of one 8" low and mid-range speaker for MFB, one 3" cone type speaker for high range, and one horn type super tweeter speaker. All three speakers and their associated cross-over networks are mounted in the same enclosure.

A brief outline of the ACCELERATION-VELOCITY type MFB as used in the MF-800 is as follows :

Motional feedback (MFB) is defined as feedback of a voltage in proportion to the vibration of the MFB speaker cone to driver stage of the amplifier. The source of the voltage pickup is an electro-mechanical device incorporated in the 8" MFB speaker (Fig. 1). The motional feedback system generally used heretofore was merely to feed back the voltage pickup in proportion to the velocity of the speaker cone. (We call it velocity type MFB.) However, the new system developed by our laboratory and used in the MF-800, also feeds back the voltage in proportion to the acceleration determined by the velocity of the speaker movement to the driver stage of the audio amplifier. Extensive research and study have proven that this method has a superior effect in extending the reproduction range and remarkably reducing distortion.

When the VELOCITY type MFB is applied to a cone type speaker mounted in an infinite baffle or in an enclosed box, the response characteristic will change, as shown in Fig. 2. However, the lowest resonant frequency does not change. Rather, the sharpness "Q" of the resonant point of the speaker movement changes. Accordingly, as the velocity feedback increases, the low range response will be lowered proportionately and tends to become over-damped, necessitating pre emphasis in the pre-amplifier circuit.



Fig. 1 CIRCUIT DIAGRAM OF FEEDBACK LOOP

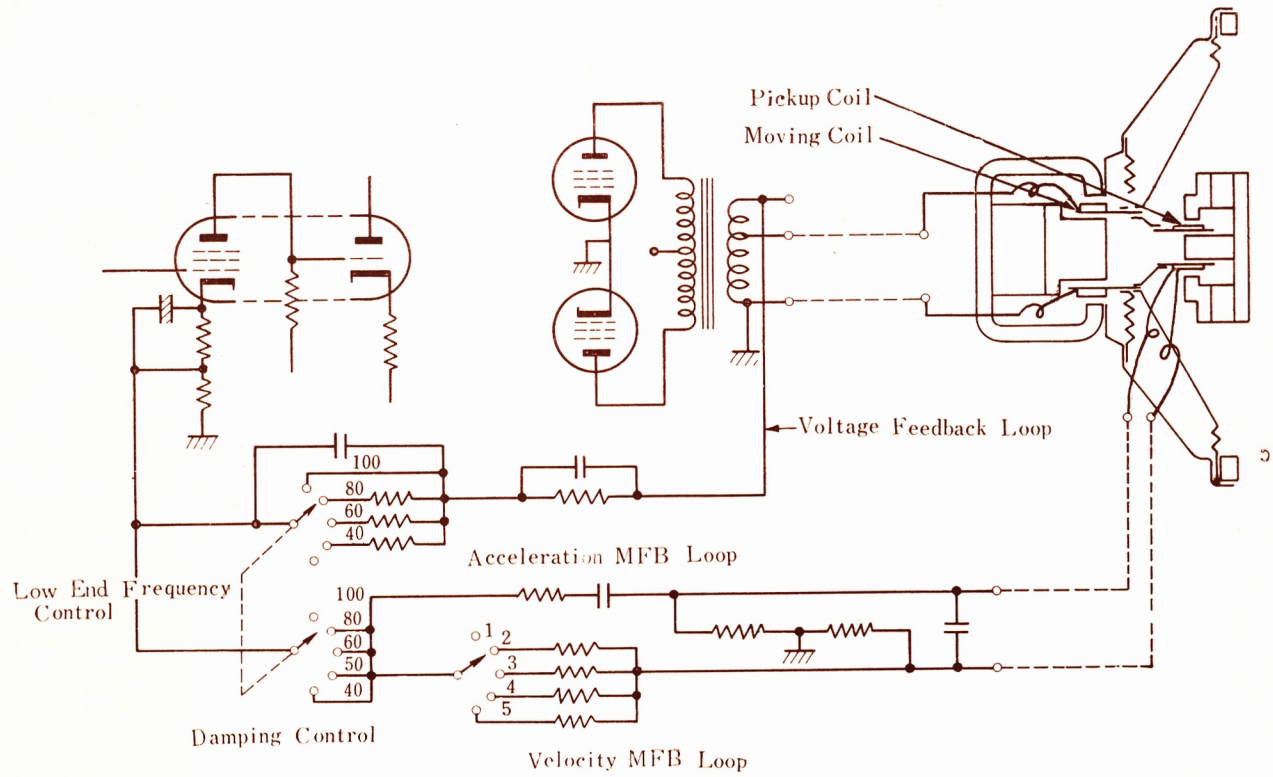
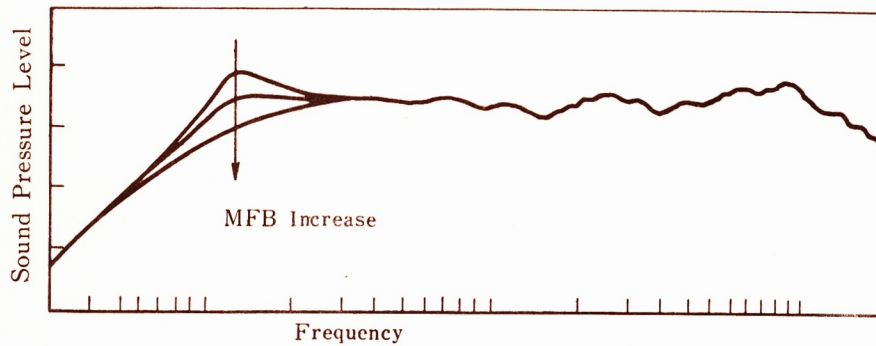


Fig. 2 EFFECT OF VELOCITY MFB





When the ACCELERATION type MFB is applied to a cone type speaker, the axis of the frequency response changes, as shown in Fig. 3. The apparent lowest resonance frequency is lowered and the resonance sharpness is increased, resulting in an expansion of the reproduction range at low frequency. There is less distortion in the ACCELERATION type MFB than in the velocity type MFB as there is no decrease of feedback even at the high frequency range. Therefore, the combination of VELOCITY type and ACCELERATION type MFB makes possible a more flexible method to change the response at the low frequency range.

Model MF-800 picks up the voltage in proportion to the velocity of the speaker cone by means of a pickup coil which is moving in the magnetic field and feeds back this voltage change in proportion to the acceleration through a differential circuit. The phase shift of the feedback voltage becomes greater in the high frequency range, and unless acceleration feedback is reduced, an unstable feedback system may result. Also, less acceleration feedback will cause an increase in gain.

The design of the Model MF-800 MFB speaker-amplifier system takes the above into consideration and insures constant gain by taking advantage of the negative feedback voltage, available from the audio output transformer through an R/C network.

Fig. 3 EFFECT OF ACCELERATION MFB.

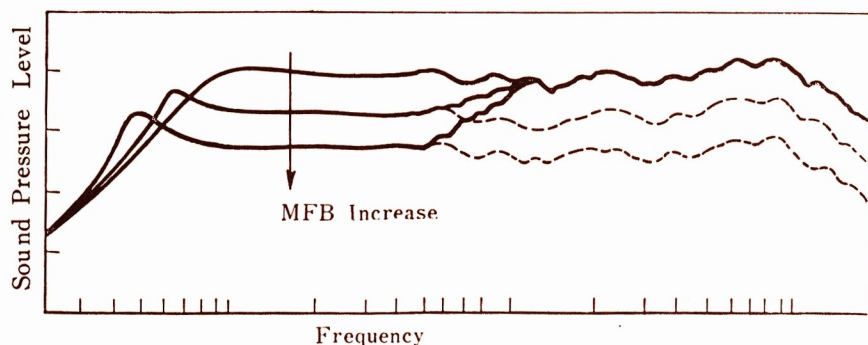
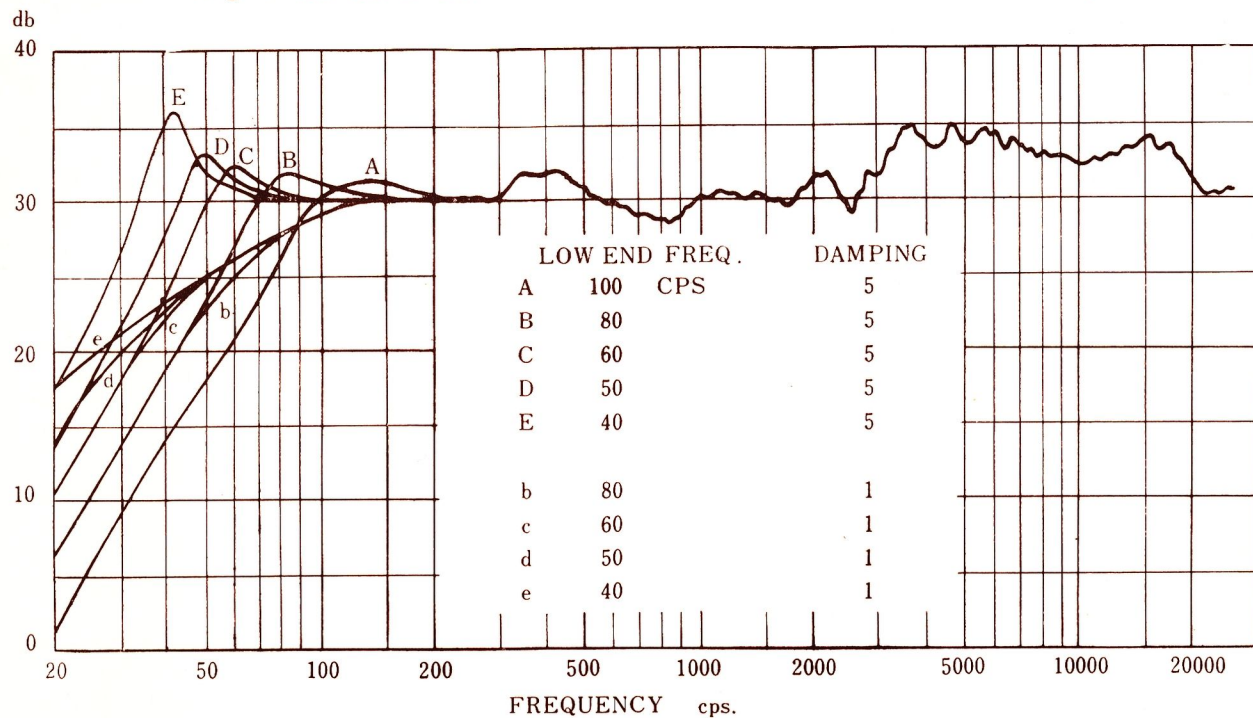
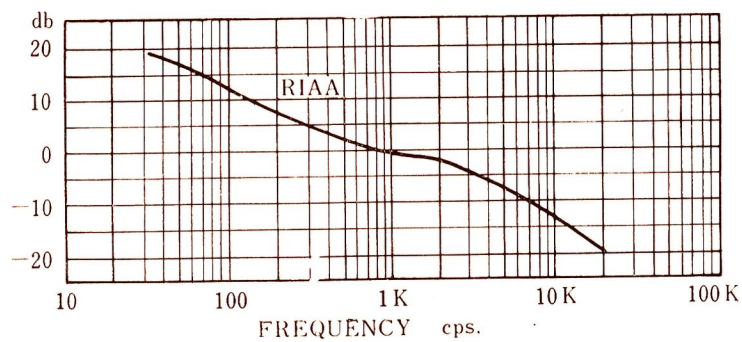


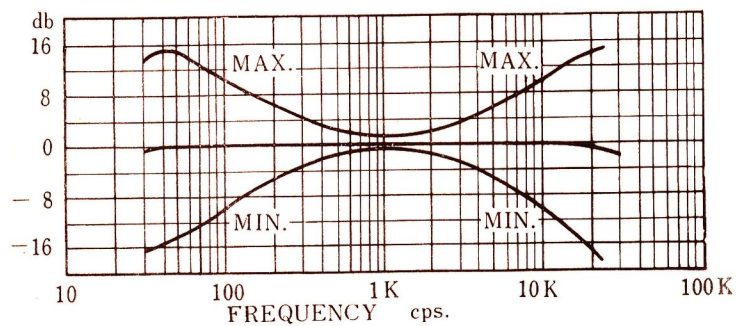
Fig. 4 MF-800 OVERALL FREQUENCY RESPONSE (TONE: FLAT)



#### EQUALIZER



#### TONE CONTROL





## SPECIFICATIONS

### MODEL MF-800-M or MF-800-W SPEAKER-AMPLIFIER SYSTEM

#### OVERALL FREQUENCY RESPONSE

(at the low end frequency position, 40cps-Damping 3)

30 - 25000cps  $\pm 5$ db

#### LOW END FREQUENCY

40, 50, 60, 80, 100, cps      5 steps

#### DAMPING

1, 2, 3, 4, 5      5 steps

### MODEL EA-801 or EA-802 AMPLIFIER

(See Fig.5)

#### TUBES

12AX7 (3), 6AN8 (2), 6BQ5 (4), 5AR4 (1)

#### INPUT

MAG PU (50K ohm)

TUNER, X'TAL PU, AUX, (1Meg ohm)

#### SENSITIVITY

MAG. PU      10W/ 3.5mV

(at 1000 cps)

TUNER      10W/ 250mV

X'TAL PU      10W/ 250mV

AUX      10W/ 250mV

#### MUSIC POWER OUTPUT

20 Watts each channel

#### INTERMODULATION DISTORTION

Less than 1% at 14 Watts; each channel

#### HARMONIC DISTORTION

0.3% at 14 Watts; each channel (Resistor load)

#### OUTPUT IMPEDANCE

8 ohm (Motional feedback speaker system)

#### EQUALIZATION

RIAA (Negative feedback)

#### TONE CONTROL

$\pm 16$  dB 50 cycle/20kc (Negative feedback)

#### POWER CONSUMPTION

115W 117V AC.

#### WEIGHT

23.2 lb.

#### DIMENSIONS

15" wide, 5½" high, 11½" deep.

### MODEL EASB-8M2 SPEAKER SYSTEM MOUNTED IN ENCLOSURE

(See Fig.6)

#### WOOFER

Model No. 8P-Z1S 8" cone type for motional feedback

#### HIGH-RANGE

Model No. MP-31SA 3" cone type

#### TWEETER

Model No. HT-23SA horn type

#### CROSS OVER FREQUENCY

high 5000 cps

low 1500 cps

#### WEIGHT

13.3 lb. each

#### DIMENSIONS

12" high, 6" deep, 20" long

## UNPACKING

Carefully remove the amplifier from its carton. If there is any physical damage to the amplifier report it to your dealer immediately. If your dealer shipped the amplifier to you, report the damage to the shipping company as soon as possible. Failure to report the damage immediately may void any claim against the carrier.

SHIPPING DAMAGE IS NOT COVERED BY THE WARRANTY.

### WHAT TO DO IN CASE OF CONCEALED DAMAGE

Concealed damage is damage which does not become apparent until the merchandise has been inspected. The contents of the carton may be damaged in transit due to rough or careless handling, even though the exterior appears undamaged.

These components were carefully inspected and packed, and left our factory in perfect condition. Any damage which occurred before they reached you must, in all probability, have been caused in transit. Responsibility for safe delivery was assumed by the carrier upon accepting the shipment. Any claims for damage must, therefore, be made by the receiver against the carrier.

### IF THIS WAS DELIVERED BY A TRANSPORTATION COMPANY

Notify that company immediately, make a written request for an inspection, and hold the merchandise and its carton for the inspector. After a joint inspection report is made, file a claim with that company.

### IF THIS WAS DELIVERED BY YOUR LOCAL DEALER

Notify the dealer immediately. He, in turn, should notify the transportation company, request an inspection, and file a claim. Hold the merchandise and its carton for inspection.

## VENTILATION

FAILURE TO PROVIDE ADEQUATE VENTILATION WILL SHORTEN THE LIFE OF THE AMPLIFIER.

The amplifier should be adequately ventilated. Be sure to leave a space of at least 4 inches from any vertical surface, such as a wall. The ventilating louvres must not be covered and a space of 4 inches between the top of the amplifier and any shelf or horizontal surface over it must be maintained.

Due to the heat produced, tuners will tend to drift if they are mounted above the amplifier. Therefore, it is recommended that the tuner be mounted below or beside the amplifier.

VERTICAL MOUNTING OF THIS AMPLIFIER IS NOT RECOMMENDED



## ELECTRICAL CONNECTIONS

### PHONO PICKUPS

#### a) Magnetic Cartridge: (Low Impedance)

When using a moving magnet type, moving coil type or variable reluctance type cartridge, the leads from the pickup should be connected to the Input Jack labeled "MAG."

#### b) Crystal or Ceramic Cartridge: (High Impedance)

When using a crystal or ceramic cartridge, the leads from the pickup should be connected to the Input Jack labeled "X'TAL."

### TUNER

The leads from a Tuner should be connected to the Jack labeled "TUNER."

### AUX

When using a tape recorder or other program source, the leads should be connected to the Input Jack labeled "AUX." As the response through this Jack is "flat," an equalized output should be added to the output of the tape recorder. The "AUX" input impedance is the same as "TUNER" and "X'TAL."

### TAPE RECORDER OUTPUT

To record with a tape recorder, the output of the program source produced by the EA-801 or EA 802 Amplifier should be taken from the Jack labeled "REC. OUT." The output voltage across this jack is not affected by the volume control.

NOTE : SHIELDED CABLE MUST BE USED ON ALL INPUT CONNECTIONS. TWIST ALL PAIRED SHIELDED LEADS TO PREVENT MAGNETIC HUM PICKUP.

### SPEAKER SYSTEMS

Connect each speaker system, Model No. EASB-8M2, to the speaker receptacle on the rear of the amplifier.

DO NOT OPERATE THE AMPLIFIER WITH EITHER SPEAKER SYSTEM DISCONNECTED.

### A.C. OUTLET :

The auxiliary power receptacle is provided for the convenient attachment of an auxiliary component. The outlet rated at 115 watts is not fused and not controlled by the on-off switch.

### FUSES :

A 2-ampere fuse is located on the rear of the chassis. Use only a 2 ampere fuse of the same type only as a replacement. If the second fuse blows, examine the amplifier thoroughly for indications of a short or component failure. Consult an experienced technician for inspection of the amplifier.

## DESCRIPTION OF CONTROLS

### INPUT SELECTOR :

Selects the program source.

### BASS CONTROL :

Changes the response in the low frequency range of the amplifier.

### TREBLE CONTROL :

Changes the response in the high frequency range of the amplifier.

### VOLUME CONTROL :

Changes the gain of both channels simultaneously.

### BALANCE CONTROL :

Adjusts the relative levels of output of both channel. Will simultaneously increase the level of output of one channel and decrease the level of output of the other channel. The "Balance Control" is adjusted in conjunction with the "Balance Indicator." Perfect balance will be obtained when playing monaural records by operating the "Balance Control" so that the pointers of the "Balance Indicator" meter are aligned with each other.

### BALANCE INDICATOR :

The "Balance Indicator" consists of two separate meters; connected across its associated speaker voice coil. To adjust for equal power output of each channel, the "Balance Control" is turned until the two pointers are aligned with each other. Care should be taken to insure that the pointers will move in the center area of the meter face. The "Balance Indicator" is effectively measuring the movement of the voice coils and too wide a movement of the "Balance Indicator" will indicate excessive excursions of the speaker voice coils.

### MODE SELECTOR :

To turn amplifier ON, turn the MODE SELECTOR KNOB to any of the below listed positions:

To turn Amplifier OFF, turn the MODE SELECTOR KNOB to the "OFF" position.

"NOR" : Input signal of "R" channel terminates in "R" channel speaker system.

Input signal of "L" channel terminates in "L" channel speaker system.

"REV" : Input signal of "R" channel terminates in "L" channel speaker system.

Input signal of "L" channel terminates in "R" channel speaker system.

"L" : Input of "L" channel terminates in both "L" and "R" speaker system.

"R" : Input of "R" channel terminates in both "L" and "R" speaker systems.

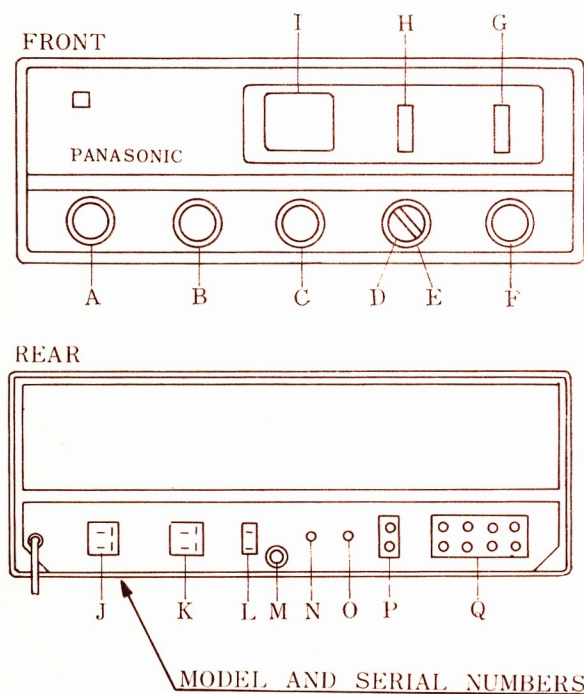
LOW FREQUENCY CONTROL : Adjusts the low frequency response; 40, 50, 60, 80, 100 cps.

DAMPING CONTROL : Selects the damping factor and is set to the position that sounds best to the listener. Normally the damping control is set at No. 3.

HUM BALANCE CONTROLS : With the VOLUME control set to minimum and the BALANCE control (front of unit) set to the center position, each "Hum Balance" control is adjusted for minimum hum level in its associated speaker system. When checking for hum level, insert the power plug into the wall outlet in the position which produces the least amount of hum.

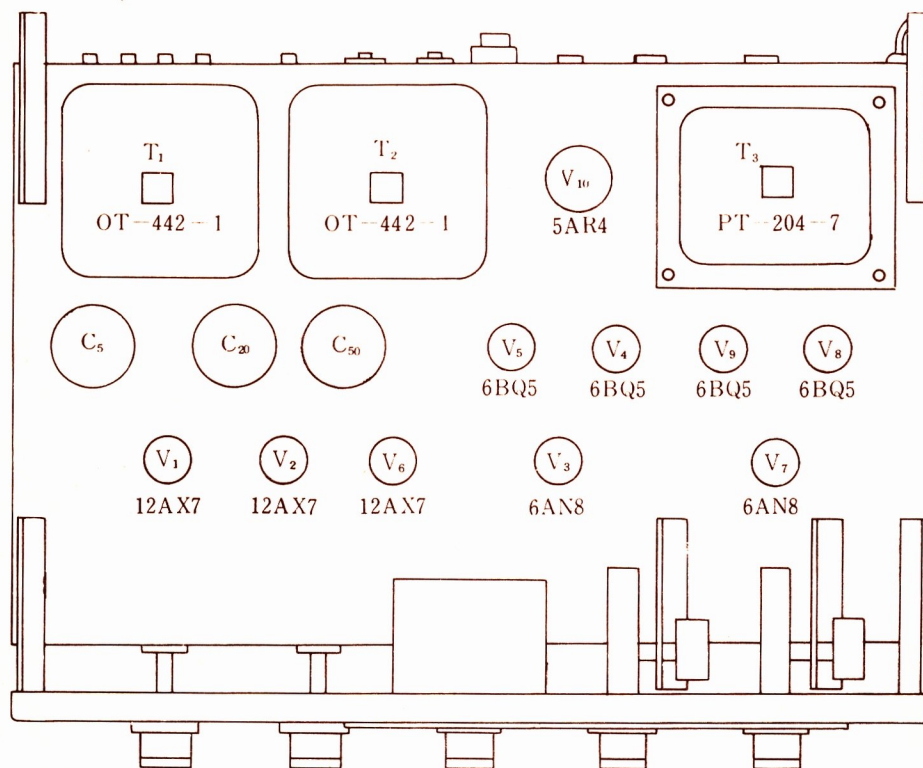


# FRONT AND REAR VIEWS OF AMPLIFIER



- A INPUT SELECTOR
- B BASS CONTROL
- C TREBLE CONTROL
- D VOLUME
- E BALANCE
- F MODE SELECTOR POWER ON OFF
- G DAMPING
- H LOW FREQUENCIES
- I BALANCE INDICATOR
- J RIGHT CHANNEL OUTPUT
- K LEFT CHANNEL OUTPUT
- L AC RECEPTACLE FOR PLAYER
- M FUSE HOLDER
- N RIGHT CHANNEL HUM BALANCE
- O LEFT CHANNEL HUM BALANCE
- P OUTPUT FOR RECORDER
- Q INPUT JACKS

## TOP VIEW OF CHASSIS (See Fig. 5 for details)



## MATSUSHITA ELECTRIC CORPORATION OF AMERICA

### WARRANTY

Our congratulations and appreciation ! You are now the possessor of the highest quality product of its type in the world. This item meets the standard of performance, serviceability and reliability beyond anything in its field. The warranty which covers this equipment is of value to you.

This warranty is effective only when the warranty-registration card is completely and properly filled and returned to the factory within ten (10) days after delivery.

A validated 90 day warranty identification card will be returned at once to the purchaser for use when in-warranty service is essential, so that you may be protected within the terms of the warranty. (Contact the Warranty Registration Section immediately if the warranty identification card is not returned within fourteen (14) days.)

Before your product left our factory, all phases of its performance were thoroughly checked by the proper test instruments. This particular PANASONIC unit exceeds current specifications for its model. Therefore, if properly used, it should meet your requirements in every detail.

If you experience difficulty in the operation of your product, or if servicing of any type be essential, contact the dealer from whom you made your purchase for the name and address of the nearest PANASONIC SERVICENTER.

If the item has been damaged in transit, please report the fact at once to your dealer.

MATSUSHITA ELECTRIC CORPORATION OF AMERICA reserves the right to modify or change this product, wholly or partially, at any time prior to the delivery so that we may include therein electrical or mechanical refinements felt to be appropriate by MATSUSHITA ELECTRIC CORPORATION OF AMERICA, but without incurring any liability to modify or change any product previously delivered, or to furnish a new product according to previous specifications.

MATSUSHITA ELECTRIC CORPORATION OF AMERICA warrants to the original using purchaser that this all new PANASONIC Product shall be free from defects in workmanship and material under normal and proper use and service for a period of 90 days from date of delivery to original using purchaser and agrees to repair or replace all parts thereof showing such defects, subject to all of the following provisions :



## **MATSUSHITA WARRANTY OBLIGATION**

- (a) Defective parts returned within 90 days from date equipment is delivered to original using purchaser, will be repaired or replaced at no charge for labor or materials.
- (b) In all warranty transactions the responsibility of MATSUSHITA shall be limited to making a new or factory-reconditioned replacement part available through an Authorized PANASONIC SERVICENTER.

## **CONDITIONS OF MATSUSHITA WARRANTY**

- (a) Warranty registration card shall have been fully and properly filled out and returned to the MATSUSHITA ELECTRIC CORPORATION OF AMERICA within ten (10) days from the date the equipment was delivered to original using purchaser ; and
- (b) Defective equipment shall be returned, transportation prepaid, to an Authorized PANASONIC SERVICENTER ; and
- (c) Purchaser, for warranty service, must present warranty identification card to an Authorized PANASONIC SERVICENTER ; and
- (d) Purchaser shall not have used or allowed to have been used in the equipment any part not supplied by MATSUSHITA ELECTRIC CORPORATION OF AMERICA through its dealers or SERVICENTERS ; and
- (e) Inspection shall disclose to MATSUSHITA's satisfaction that the defects are as above specified and that the equipment has not been altered or repaired by other than factory approved procedures, subjected to negligence, misuse or accident, or damaged by excessive current or otherwise, or had its serial number or any part thereof altered, defaced or removed.
- (f) Replacement parts supplied under this warranty carry only the unexpired portion of the original warranty.

## **SOLE WARRANTY**

This warranty is expressly in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on the part of MATSUSHITA.

No person, including any dealer, agent or representative of MATSUSHITA ELECTRIC CORPORATION OF AMERICA, is authorized to assume for MATSUSHITA any liability on its behalf or in its name except to refer purchasers to this warranty. In no event shall MATSUSHITA be liable for claims, demands or damages of any nature, however denominated ; MATSUSHITA'S sole warranty liability shall be to repair defective items or to supply replacement parts in accordance with the terms of this warranty.

## PRODUCT SERVICE

All electrical equipment requires maintenance. The MF-800 Speaker Amplifier System was designed to operate trouble-free for many years. However, certain checks made at the end of every year will help to keep the amplifier in good condition.

Check the tubes, particularly those in the power output stage, and the rectifier. Replace those tubes which check weak or show gas. Gassy tubes may damage other components in the circuit.

Each time the unit is checked, clean the dust from the tubes so that they radiate their heat more effectively.

DO NOT USE TUBES OTHER THAN SPECIFIED FOR THIS AMPLIFIER. THE INSTALLATION OF ANY UNSPECIFIED PART VOIDS THE WARRANTY.

Do not use fuse sizes other than specified. To do otherwise may result in permanent and costly damage to the amplifier.

Should your PANASONIC component require servicing, please bring it to one of the nationwide PANASONIC SERVICENTERS organized for consumer convenience. (See your PANASONIC dealer for the name and address) or write to the address listed below, describing the unit's difficulties :

### MATSUSHITA ELECTRIC CORPORATION OF AMERICA

Office of Technical Services

200 Park Avenue

New York, N. Y., 10017

DO NOT RETURN ANY UNIT TO MATSUSHITA ELECTRIC CORPORATION OF AMERICA for in-warranty repairs without first obtaining written authorization from the Manager, Technical Services.

Ship unit fully insured, PREPAID, in the component's original SPECIALLY DESIGNED SHIPPING CARTON. Your unit will receive prompt and careful attention and will be returned by express prepaid during the warranty period.

Should there be any questions concerning the operation or service of the MF-800 Speaker-Amplifier System, a letter to the address listed above will bring a prompt personal reply.



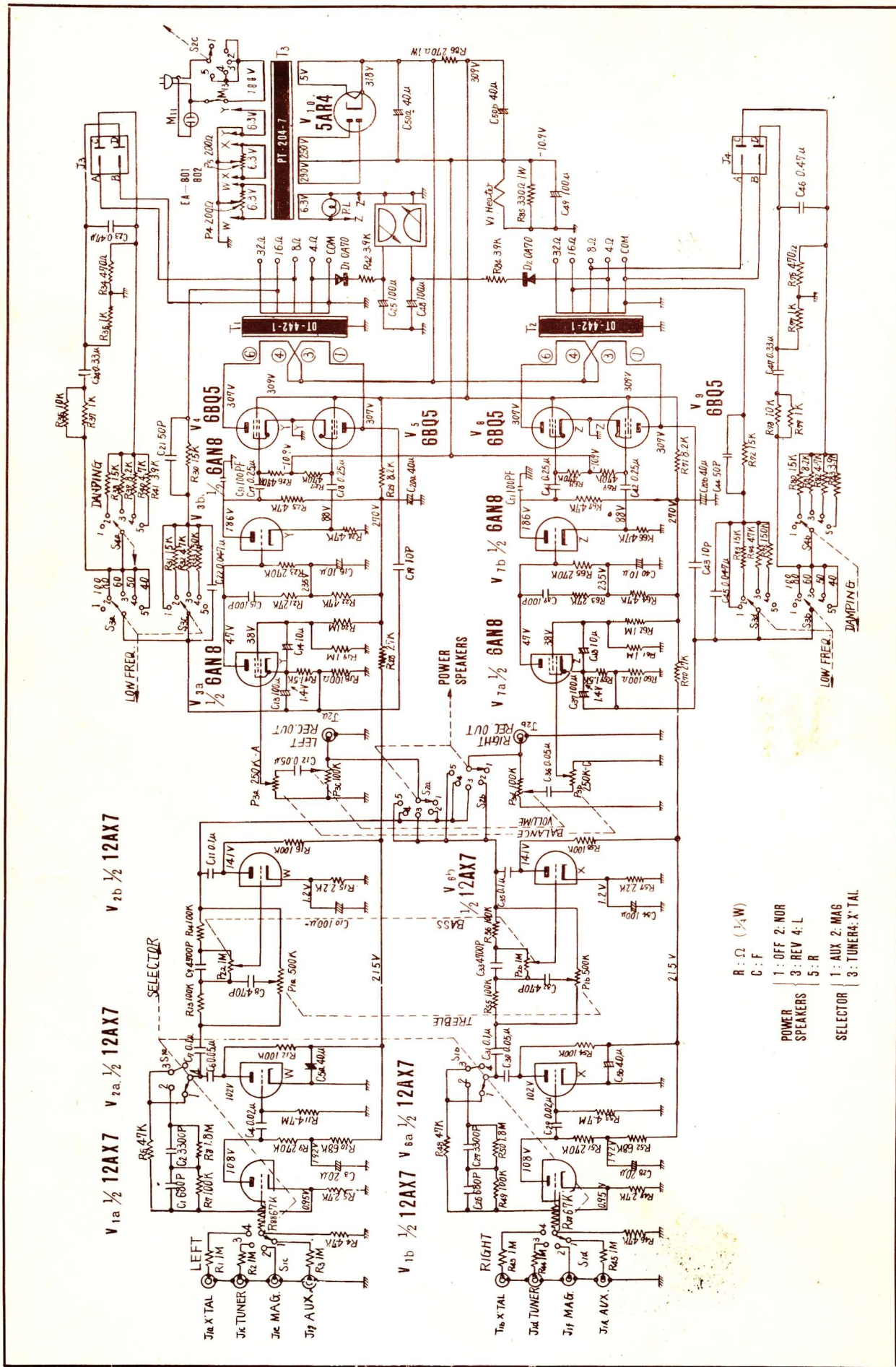
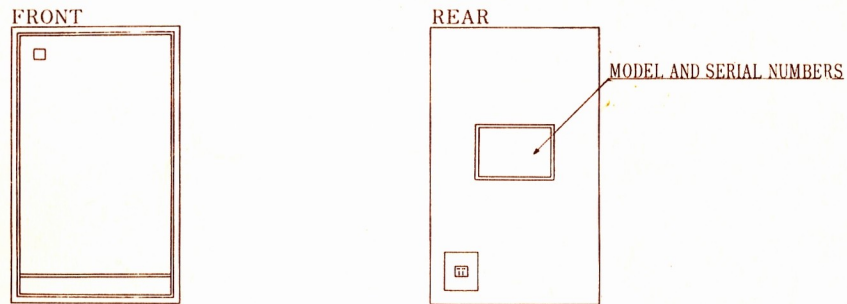


Fig. 5 CIRCUIT DIAGRAM OF MODEL EA-801 AND EA-802 AMPLIFIER

# SPEAKER SYSTEM EASB-8M2

WOOFER	8P-Z1S 8" cone type for motional feedback.
HIGH-RANGE	MP-31SA 3" cone type
TWEETER	HT-23SA horn type
CROSS OVER FREQUENCY	high 5000 cps
	low 1500 cps
WEIGHT	13.3 lb each
DIMENSIONS	12" high, 6" deep, 20" long



FRONT AND REAR VIEWS OF SPEAKER SYSTEM

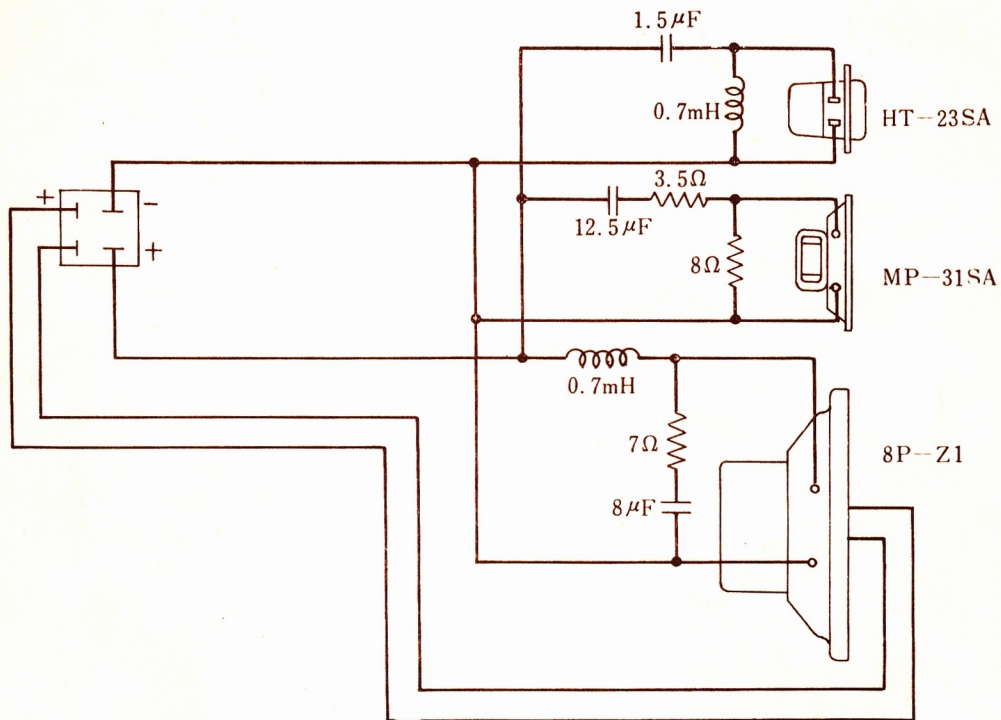
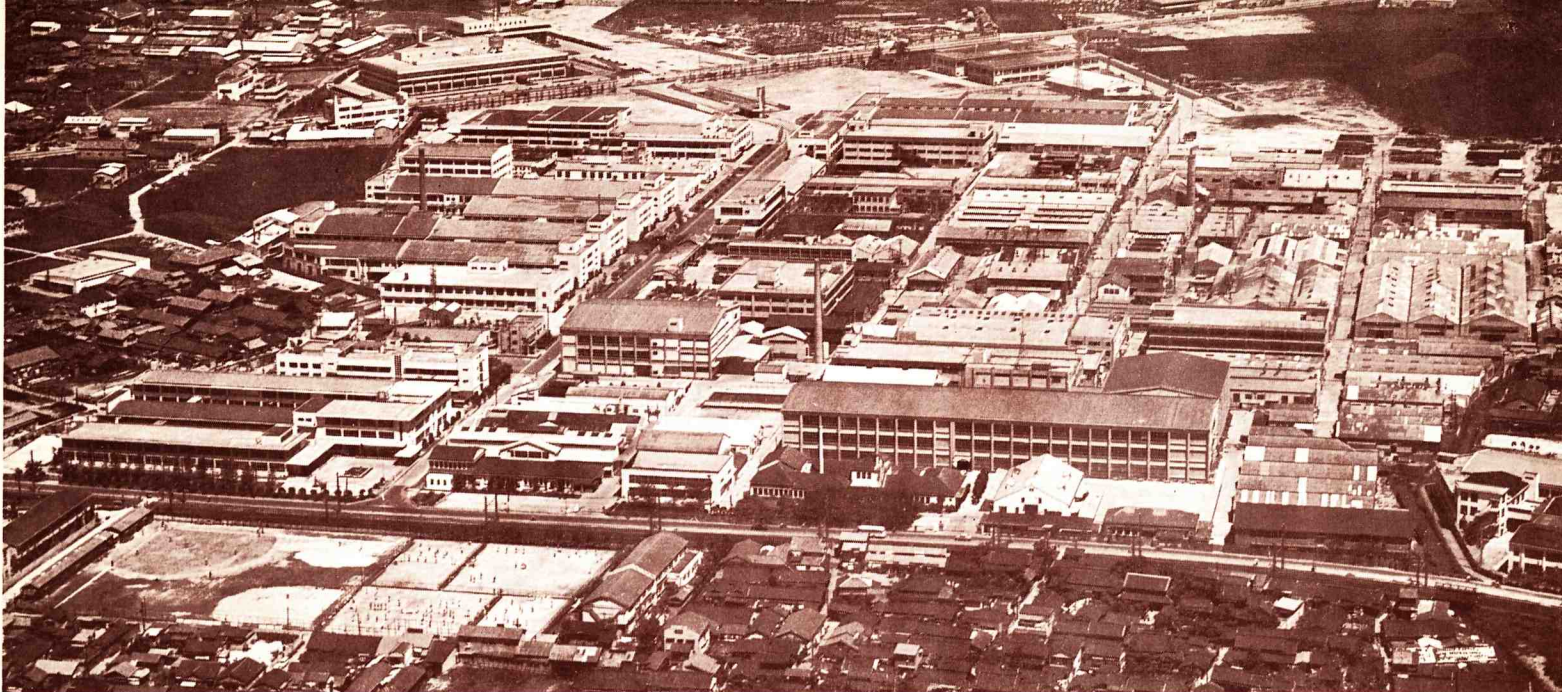
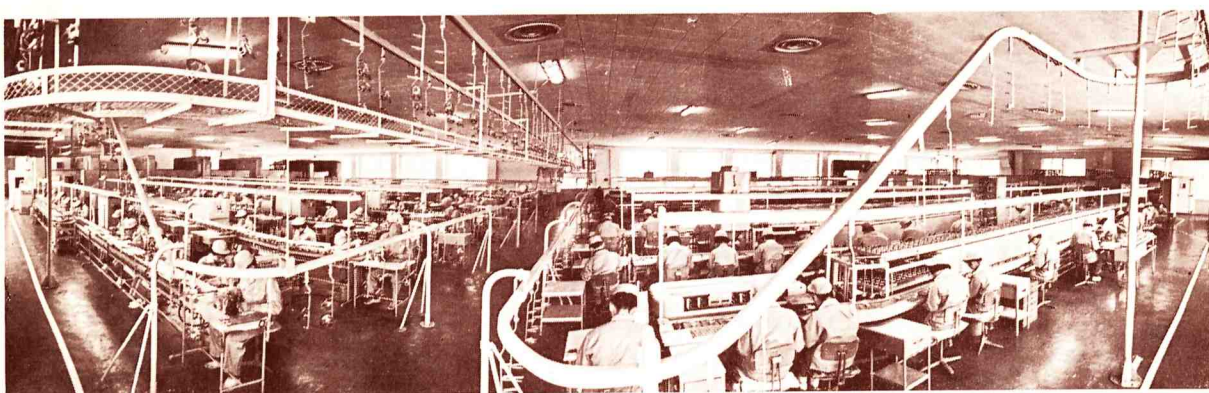


Fig. 6 SCHEMATIC DIAGRAM OF MODEL EASB-8M2 SPEAKER SYSTEM

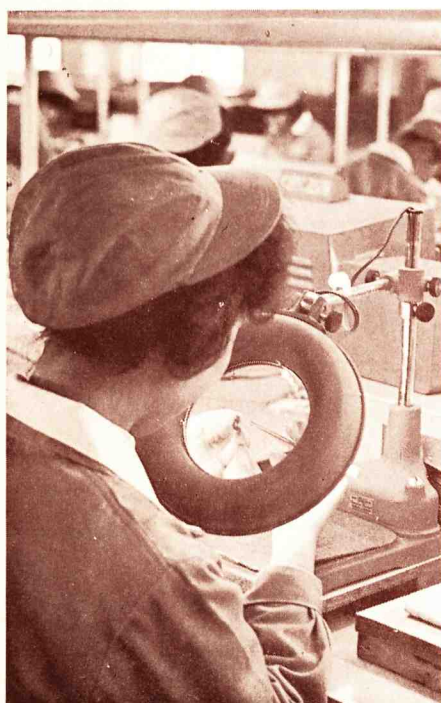




KADOMA site of Matsushita Electric



Speakers in mass production



With help of a lens



Array of automatic winding machines



# **MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.**

Kadoma, Osaka, Japan

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