

**811C  
813C  
815C  
TIME ALIGN<sup>®</sup> MONITOR**



**UREI Incorporated  
8400 BALBOA BOULEVARD  
NORTHRIDGE, CA. 91325-4100 U.S.A.  
PHONE: (818) 895-UREI (895-8734)  
FAX: (818) 891-5475**



**Printed in U.S.A.**

**Copyright 1987 UREI**

## PREFACE

Thank you for purchasing this UREI product. The UREI 811C, 813C and 815C Time Align® Studio Monitors are designed for critical listening applications in professional installations. When used correctly, they provide a clear sound "picture" of the signal with full dimensionality. We have prepared this instruction manual to enable you to achieve optimum utility and performance from your new Time Align® Studio Monitor. We encourage you to read and to make use of the material contained in this manual. We welcome your suggestions and comments.

This manual is dedicated to all the people who are interested in learning about the capabilities and limitations of our products in order to use them to their full potential. Learn, Enjoy and Share.

## UNPACKING AND INSPECTION

Your new UREI Time Align® Studio Monitor was carefully packed at the factory, and the container was designed to protect the unit during shipment. Nevertheless, we recommend careful examination of the shipping carton and its contents for any sign of physical damage which may have occurred in transit.

**CAUTION:** The blue foam surrounding the mouth of the horn and the padding inside the horn are installed for acoustical reasons. These are an integral part of the horn design and NOT packing materials. DO NOT REMOVE THEM!

If damage is evident, do not destroy any of the packing material or the carton, and immediately notify the carrier of a possible claim for damage. Damage claims must be made by you.

The shipping carton should contain:

The UREI Model 811C, 813C or 815C Time Align® Studio Monitor, as appropriate.

This Instruction Manual, which serves all three systems.

## FREQUENCY RESPONSE AND ROOM PLACEMENT

The UREI Time Align® Studio Monitor Systems are shipped from the factory with all of the front panel controls set in the fully clockwise position. The effect of these controls on system response for a "nominal" system is shown in the figures at the end of the manual. Figure 1 shows the response of the 811C, Figure 2 the 813C, and Figure 3 the 815C. Each monitor system is checked to make certain that the nominal response can be achieved in a "free space" environment regardless of tolerances on individual system components.

The front panel controls are made available to adjust the system output to compensate for differences in control room acoustics and for small variations from one speaker to another due to manufacturing tolerances. However, we recommend that these controls be set in the "flat" position and that control room equalization be performed with an electronic equalizer such as the UREI Model 539 or JBL/UREI Model 5549A Room Equalizer.

Room placement has a great effect on relative sound pressure level below 150 Hz.<sup>4</sup> Figures 1-3, 2-3, and 3-3 show sound pressure versus frequency for typical control room mounting (quarter space) response as compared to 4 pi steradian (free space) response (comparable to placement outdoors or with the system suspended in the middle of a large room far above the floor).

Quarter space response is comparable to placement at the intersection of two boundaries, such as the wall and ceiling of a control room. These curves are given as guidelines and are not intended as replacements for accurate response measurements in the room at the time the monitors are installed.

Electronic equalization can be used to compensate for loudspeaker placement in a room to some extent. Large amounts of boost (i.e. more than 6 dB) at frequencies below 80 Hz should not be used, so that the displacement limits of the system are not exceeded and distortion or damage are avoided when the system is operated at high power levels. No boost should be used below 30 Hz. We recommend that a high pass (low cut) filter be used to reduce the signal level below 30 Hz. A filter of this type is provided in the UREI Model 539 or in the JBL/UREI Model 5549A; alternatively, the UREI Model 501 Subsonic Processor, which is a two-channel filter with a corner frequency of 30 Hz when set in the FLAT position, may be installed ahead of the power amplifier inputs.

Smoothest low frequency response will be achieved if the system is mounted so that the front panel is flush with the wall surface and it is away from adjacent wall, ceiling or floor boundaries. The UREI Studio Monitors are supplied in mirror image cabinet pairs, and we recommend that the cabinets be mounted with the control boxes away from the center of the control room. For best stereo imaging, the distance between the cabinets should be approximately 0.9 to 1.1 times the distance from the mixer's position to the wall. The speakers should be angled vertically and horizontally so that the listening position is on the axis of both blue horns. The coverage angle of the high frequency horn is approximately 85° horizontal by 35° vertical. It is permissible to rotate the cabinets 90° if that orientation is necessary for your room. In that event, the clamps should be loosened on the coaxial driver and the driver rotated 90°.

Crimped terminals on heavy gauge stranded wire (at least 12 AWG [2 mm]) should be used to interconnect the loudspeaker and amplifier. Heavier wire should be used for lengths greater than approximately 7.5 meters (25 feet). Positive voltage applied to the red terminal will cause forward motion (toward the listener) of the woofer cones.

### POWER AMPLIFIER SELECTION AND CONNECTION

The Studio Monitor Systems are rated at 200 Watts, 40 Hz to 20 kHz\*. To avoid clipping short duration signal peaks when reproducing contemporary music at high levels, an amplifier with a power rating of at least 300 watts per channel into 4 ohm loads is recommended. The JBL/UREI 6260 Power Amplifier, rated at 300 Watts/channel into 4 ohm loads, or the JBL/UREI Model 6290 Amplifier rated at 600 Watts/channel would be good choices.

\* The power rating is based on using a test signal of filtered random noise conforming to international standard IEC 268-1 (pink noise with 12dB per octave rolloff below 40 Hz and above 5000 Hz and with peak-to-average ratio of 6 dB).

The UREI Studio Monitor Systems were designed to be sourced from very low impedance amplifier outputs. Some recently introduced amplifiers are adjustable for negative output resistance. These amplifiers are not recommended. "Unless the negative impedance amplifier is properly designed for the speaker with which it is used, the interaction of the speaker and amplifier may seriously upset the overall frequency response curve."<sup>6</sup> The usual result is that the system is overdamped and low frequency response suffers.

Amplifiers with transformer-coupled outputs usually offer a selection of impedances. We recommend that the Monitor System be connected to the 4 ohm output of such amplifiers.

Some amplifiers employ output transistor protection circuits which are fooled by reactive loads, causing an objectionable "chatter" when operating near clipping levels. It is possible to damage the high frequency diaphragm of the coaxial driver when heavy clipping occurs. Note that it is possible, with such an amplifier, to blow the high frequency driver on clipped low frequency signals! The Time Align<sup>®</sup> Studio Monitors should be used with only the highest quality professional amplifiers to realize best possible performance.

### CONTROL PANEL

The Studio Monitor System includes a crossover network and control panel. The network, mounted on the enclosure baffle, has three adjustments: High Frequency Trim, High Frequency Drive and Midrange. The action of these controls is shown in the figures at the end of the manual. Figure 1 shows the response of the 811C, Figure 2 the 813C, and Figure 3 the 815C.

NOTE: If the UREI Monitor Systems are driven with high signal levels while a transducer is disconnected, or has an open voice coil, voltages may be developed which exceed the ratings of the capacitors in the network. The warranty is void if the network is operated without a proper load.

The loudspeakers may be removed from the front of the enclosure by removing the bolts and clamps which hold them in place and disconnecting the wires. When reinstalling the speakers, be certain that the proper wires are connected to the proper terminals, as shown in the following table:

<u>WIRE COLOR</u>	<u>LOUDSPEAKER TERMINAL</u>	<u>MODEL</u>
Black	801C HF Black	811C, 813C, 815C
Red	801C HF Red	811C, 813C, 815C
White	801C LF -	811C, 813C, 815C
Green	801C LF +	811C, 813C, 815C
Brown *	2215 Red	813C, 815C (2 each)
Yellow	2215 Black	813C, 815C (2 each)

\* There is a red plastic cable tie on this lead as a reminder to connect it to the red terminal.

**SPECIFICATIONS:**

	<b><u>FREQUENCY RESPONSE</u></b>	<b><u>SENSITIVITY</u></b>
811C	70 Hz-17.5kHz $\pm 3$ dB	97dB SPL/watt/meter
813C	50 Hz-17.5kHz $\pm 3$ dB	101dB SPL/watt/meter
815C	40 Hz-17.5kHz $\pm 3$ dB	103dB SPL/watt/meter

**REPAIRS AND WARRANTY**

This product is warranted by the manufacturer to the original purchaser against defects in material and workmanship for a period of one year from the date of purchase. We suggest that you retain a copy of your dated sales receipt for proof of warranty status should that be necessary.

In case of transducer failures, service should be done only by qualified loudspeaker repair technicians. Attempts at repair by untrained personnel may result in further damage and may void the warranty. Contact your UREI dealer or the UREI Customer Service Department for assistance in obtaining transducer service.

It is unlikely that network components will fail. Field service of internal components is not normally authorized, and attempts at servicing may void the warranty. Contact your UREI dealer or UREI Customer Service in case problems with the network are suspected. In the event that it should be necessary to gain access to the network components, the control panel may be removed from the front baffle by removing the four wood screws holding it in place. The network may then be pulled out for inspection.

If you wish to return a defective component to the factory, please call or write to the Customer Service Department at the Service address listed on the title page of this manual for a Return Authorization Number. All products returned to the factory must be accompanied by a Return Authorization Number, and must be shipped prepaid. COD shipments will not be accepted.

For prompt service, ship the defective component only to the factory with the RA number marked on the shipping label. Be sure that it is well packed in a sturdy carton, with shock absorbing material surrounding the unit. Pay particular attention to protecting the blue foam on the front of the coaxial driver and make sure that the unit cannot drift around in the shipping box. Please feel free to call us for a shipping container. We will add the nominal cost to your repair bill. Shipping damage caused by inadequate packing is not covered by the JBL/UREI warranty. Tape a note to the unit describing the problem, include your name and a phone number where we may contact you if necessary, and give us instructions for returning the product. We will pay return shipping costs on any repair covered under the terms of this warranty.

## REFERENCES

Some of the following sources are referred to in the text above. Others are listed as an aid to those who desire further technical information about the Time Align<sup>®</sup> Studio Monitors and the installation and operation of monitors in control rooms.

1. "Determination of Loudspeaker Signal Arrival Times," by Richard C. Heyser, JAES, October and November, 1971.
2. "Geometry of Sound Perception," by R.C. Heyser, Technical Paper at May 1975 AES Convention.
3. "A Time-Align Technique for Loudspeaker System Design," by Edward M. Long, Technical Paper at May 1976 AES Convention.
4. "Elements of Acoustical Engineering," by Harry F. Olson.
5. "Standing Waves in Rooms," by Michael Rettinger, Recording Engineer/Producer, December 1976.
6. "Application of Negative Impedance Amplifiers to Loudspeaker Systems," by Werner and Carrell, JAES, October 1958.
7. "Time-Aligned Loudspeaker Systems," by Dean Austin, db Magazine, March 1979.
8. "Time-Aligned Loudspeakers Revisited," by Dean Austin, db Magazine, August 1981.

# 811C STUDIO MONITOR

10dB

A - CONTROLS IN "FLAT" POSITION

FIG. 1-1 H F CONTROLS

B - ALL CONTROLS FULL CW

C - HI FREQ TRIM FULL CCW

D - HI FREQ DRIVE & TRIM FULL CCW

FIG. 1-2 MIDRANGE CONTROL

E - MIDRANGE CONTROL FULL CW

F - MIDRANGE CONTROL FULL CCW

FIG. 1-3 ROOM EFFECT

G - 4 PI STERADIAN (FREE SPACE) RESPONSE

H - RESPONSE IN TYPICAL CONTROL ROOM - UNEQUALIZED (QUARTER SPACE MOUNTING)

FREQUENCY IN CYCLES PER SECOND

FIGURE 1

20 2 3 4 5 6 7 8 9 1 100 1000 20000

# 813C STUDIO MONITOR

10dB

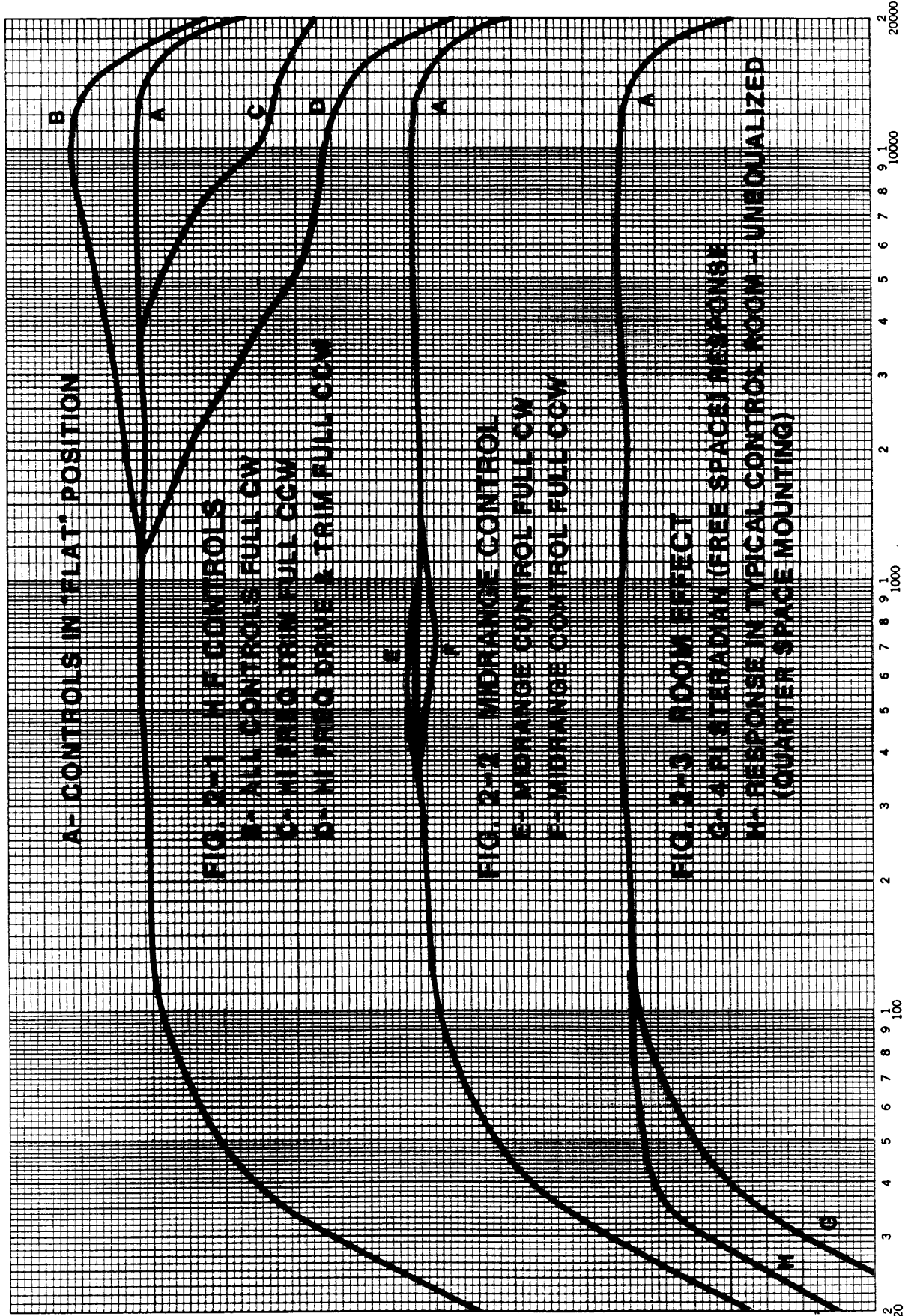


FIGURE 2



# 815C STUDIO MONITOR

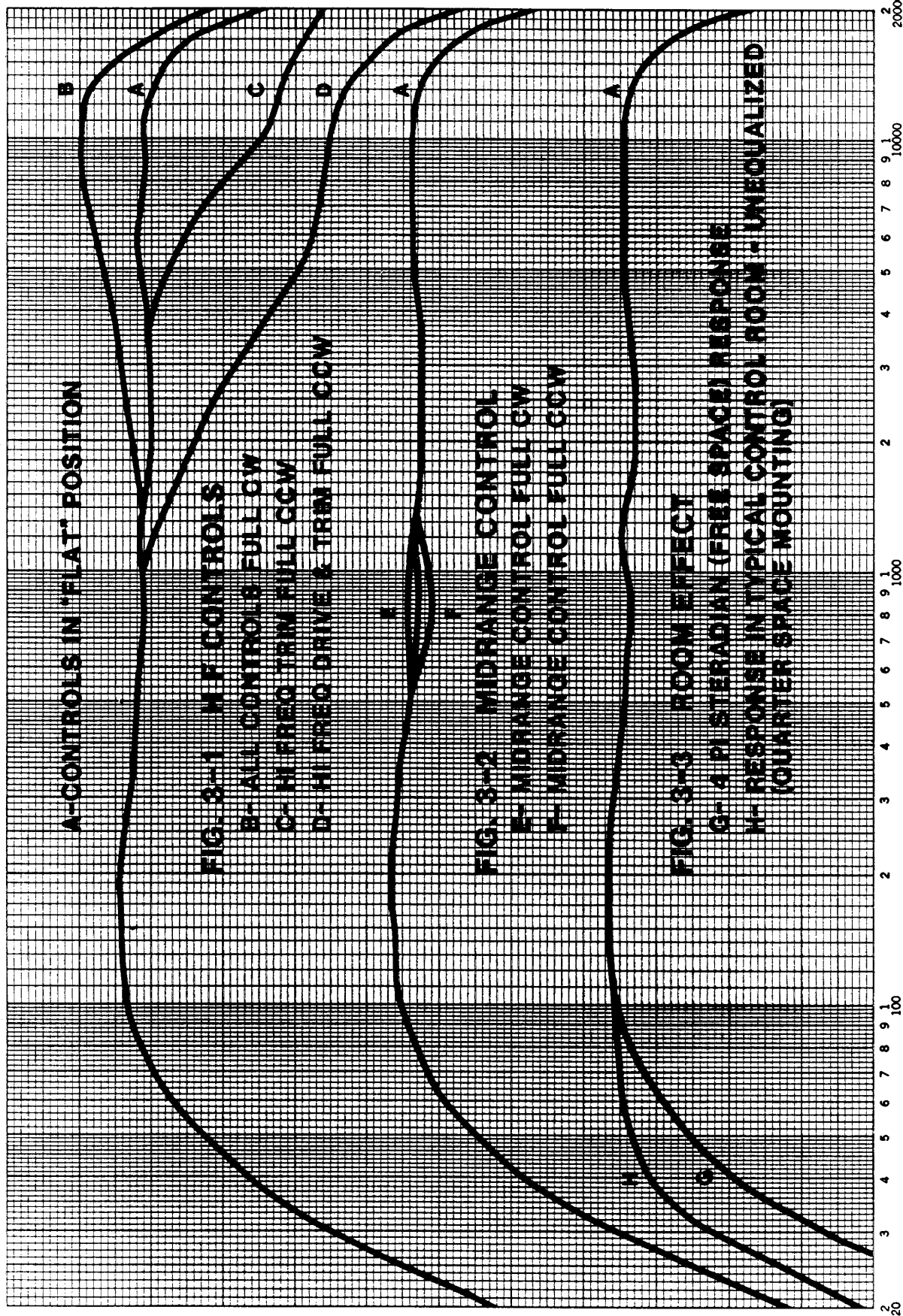


FIGURE 3