

## MO-3625 GAIN SET

GETTING ACQUAINTED ....

Read thoroughly the instruction sheets that accompany the B & W Type 200 audio oscillator and the Type 400 noise and distortion meter. Become thoroughly acquainted with these instruments as to how they operate and the functions that they are capable of performing. You will find by becoming thoroughly acquainted with these instruments that the proof of performance will be very simple.

This unit provides a multiple of functions, such as audio level indication, impedance matching and calibrated loss insertion. The input and output circuit of this unit is balanced. Therefore, it is important to note that it must be used with an audio oscillator that provides a balanced output such as the Barker & Williamson Model 200.

The MO-3625 must likewise be terminated in a balanced load such as provided by the balanced input of an audio amplifier or the balanced audio input of a transmitter.

If the audio oscillator or the equipment under test does not present a balanced circuit such as mentioned in the preceding paragraph, a Gates Type A-3580 repeater transformer must be used for isolation purposes. The MO-3625 has undergone extensive tests in the Gates Laboratories. The accuracy of this instrument cannot be guaranteed if any unauthorized circuit changes or calibration changes are made outside of the Gates Laboratories.

Front Panel Controls -- All controls pertaining to the ordinary functions of this unit are located on the front panel.

- (a) Noise Key -- When in the center position this key connects the external audio oscillator to the VU meter circuit and the attenuation and impedance matching circuits in this MO-3625. When in the up or "NOISE TEST" position, the external oscillator is disconnected from the internal circuits and a load is placed across the unit to simulate the impedance of the audio oscillator. The noise key is placed in the "ON" position for both response and distortion measurements. This key is placed in the "NOISE TEST" position only when noise measurements are being taken.

VU Range Keys - The center key of the set of three keys controls the position of the variable attenuator in the circuit. When this key is in the center position labeled "PAD OUT" the variable attenuator is disconnected from the circuit. This is done in instances

where outputs as high as +20 VU are required. When in the up position labeled "PAD IN", the variable attenuator is placed in the attenuation circuit. With this variable attenuator in the circuit, it is possible to read a maximum level of +15 VU.

The VU range key (the key located close to the meter) is a three position key providing 6 VU ranges. It should be noticed that this key is marked with three ranges on either side. To the left of this key from top to bottom are the ranges +10, +16 and +21. All of these ranges are set off in individual brackets. To the right of this key from top to bottom are the ranges +4, +10 and +15. This key is used in conjunction with the "PAD IN - PAD OUT" Key. For example, when the center key is in the "PAD OUT" position, the calibrations on the left of the range key (those enclosed in brackets) are used. When the center key is in the "PAD IN" position, the calibrations on the right side of the range key are used.

Observation of the six ranges will disclose a difference of 6 DB between any two adjacent ranges. This 6 DB difference is necessary in order to compensate for the insertion loss of the variable attenuator which is 6 DB.

VU Meter -- The VU meter is used for the purpose of correct input level setting. The range for this meter is selected by the range key located adjacent to the meter as mentioned in the preceding paragraphs. It should be remembered that the VU meter does not indicate the output level of the instrument. It indicates the reference level from which the sum of the values of the fixed plug-in pads and the attenuation of the variable attenuator is subtracted. For example, if the pad key is placed in the "PAD IN" position and the range key in the +4 position, and the audio level is increased until the VU meter indicates "0" VU on the scale, then the reference level is +4. The output level will then be +4 less any losses due to the insertion of any plug-in pads or any losses due to the setting of the variable attenuator.

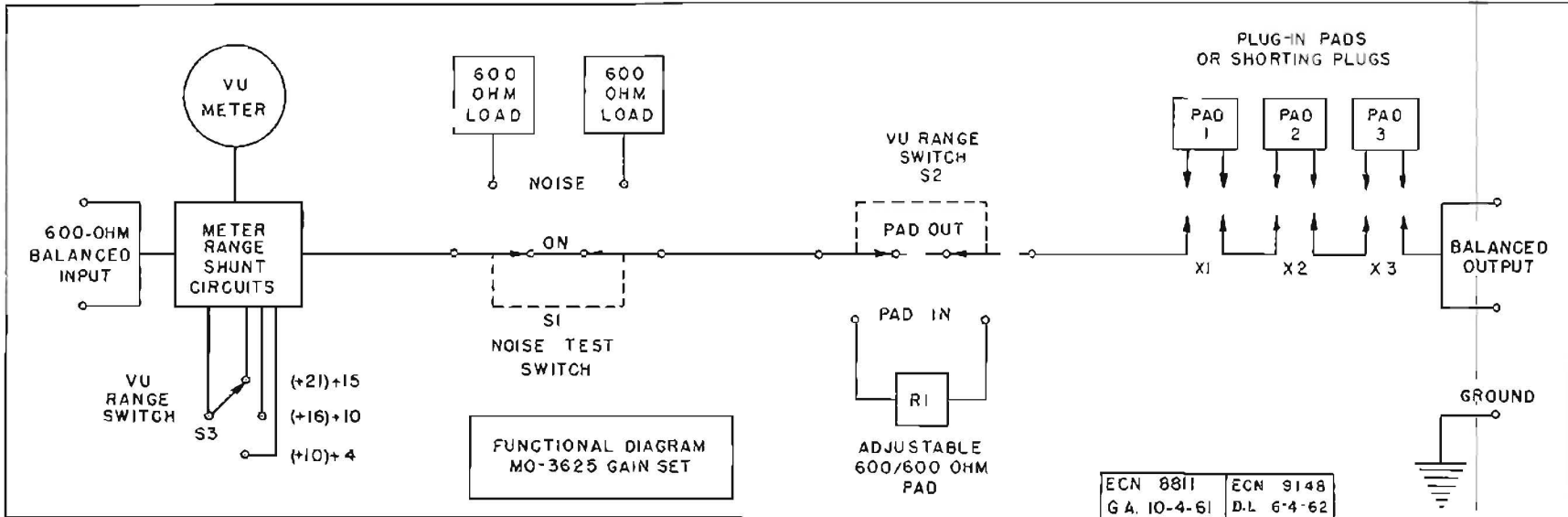
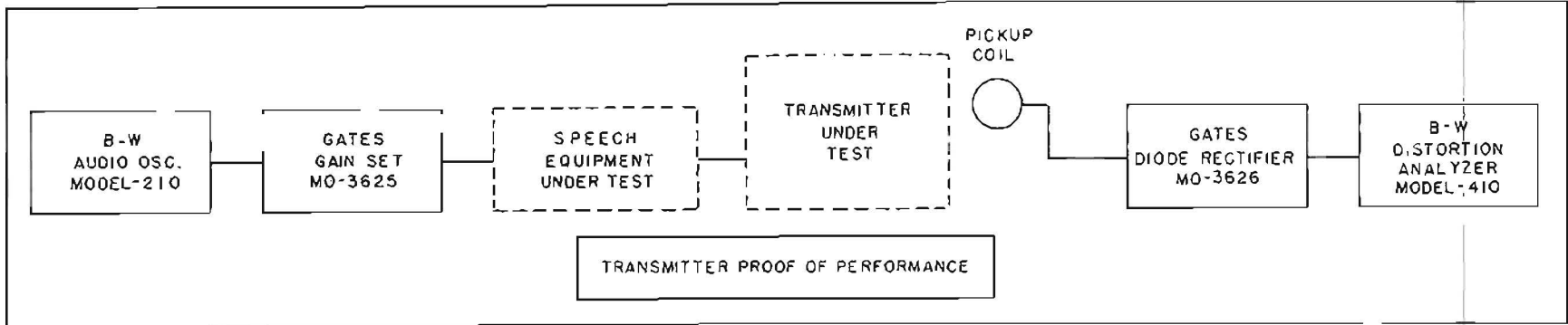
Variable Attenuator -- The variable attenuator is a balanced ladder type providing attenuation in steps of 2 DB. This 10 step control makes possible a maximum attenuation in the control of 20 DB.

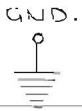
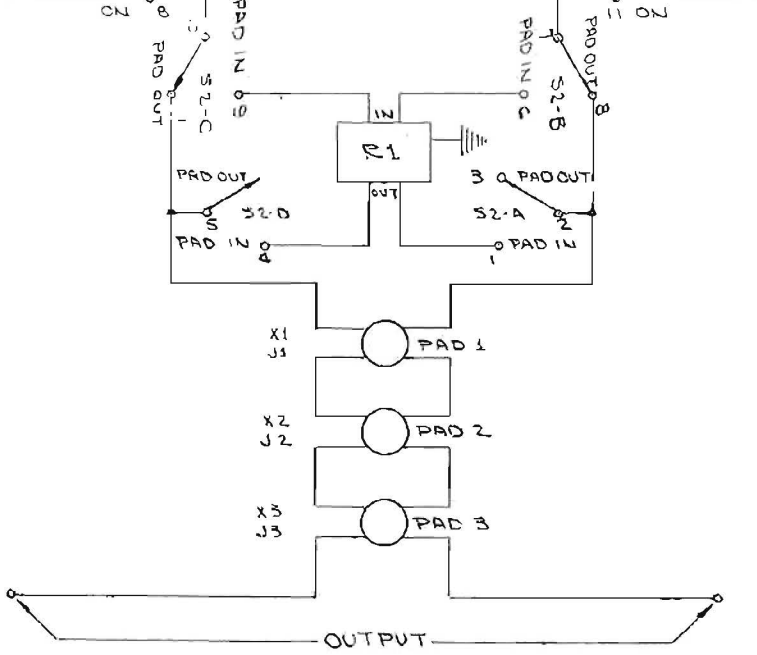
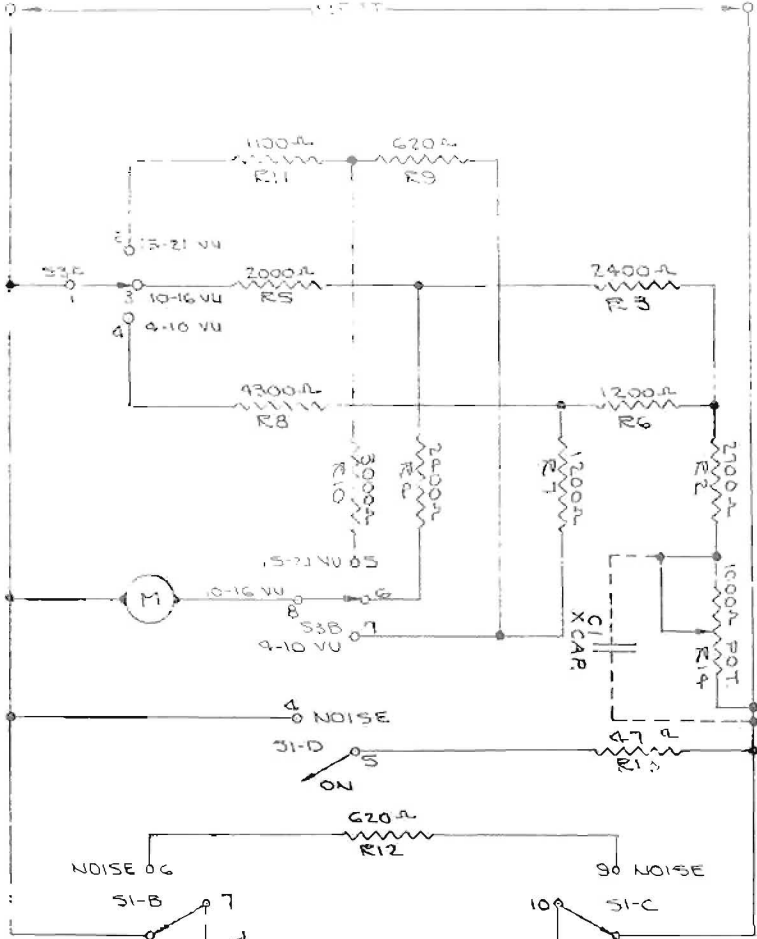
Plug-in Pads One, Two and Three -- Plug-in pads as used in this unit provide an exceedingly flexible method of loss adjustments and impedance matching. If less than 20 DB loss from the reference level is required then the plug-in pads do not have to be used. The loss from 2 to 20 DB can be adjusted by means of the variable attenuator. When the plug-in pads are not used the shorting plugs must be inserted in the pad sockets. The three sockets labeled

"PAD TWO" and "PAD THREE" must have either pads or shorting plugs inserted at all times for the proper operation of this unit. The shorting plugs complete the series attenuation circuit when pads are not used. The pad inserted in the "PAD THREE" socket should be used for both attenuation and impedance matching. The pads inserted in sockets marked "PAD ONE" and "PAD TWO" should always be 600/600 ohm pads for this is the internal impedance of the Gain Set. If no pads are required and all three shorting plugs are inserted, the output impedance will be 600 ohms balanced.

PARTS LIST

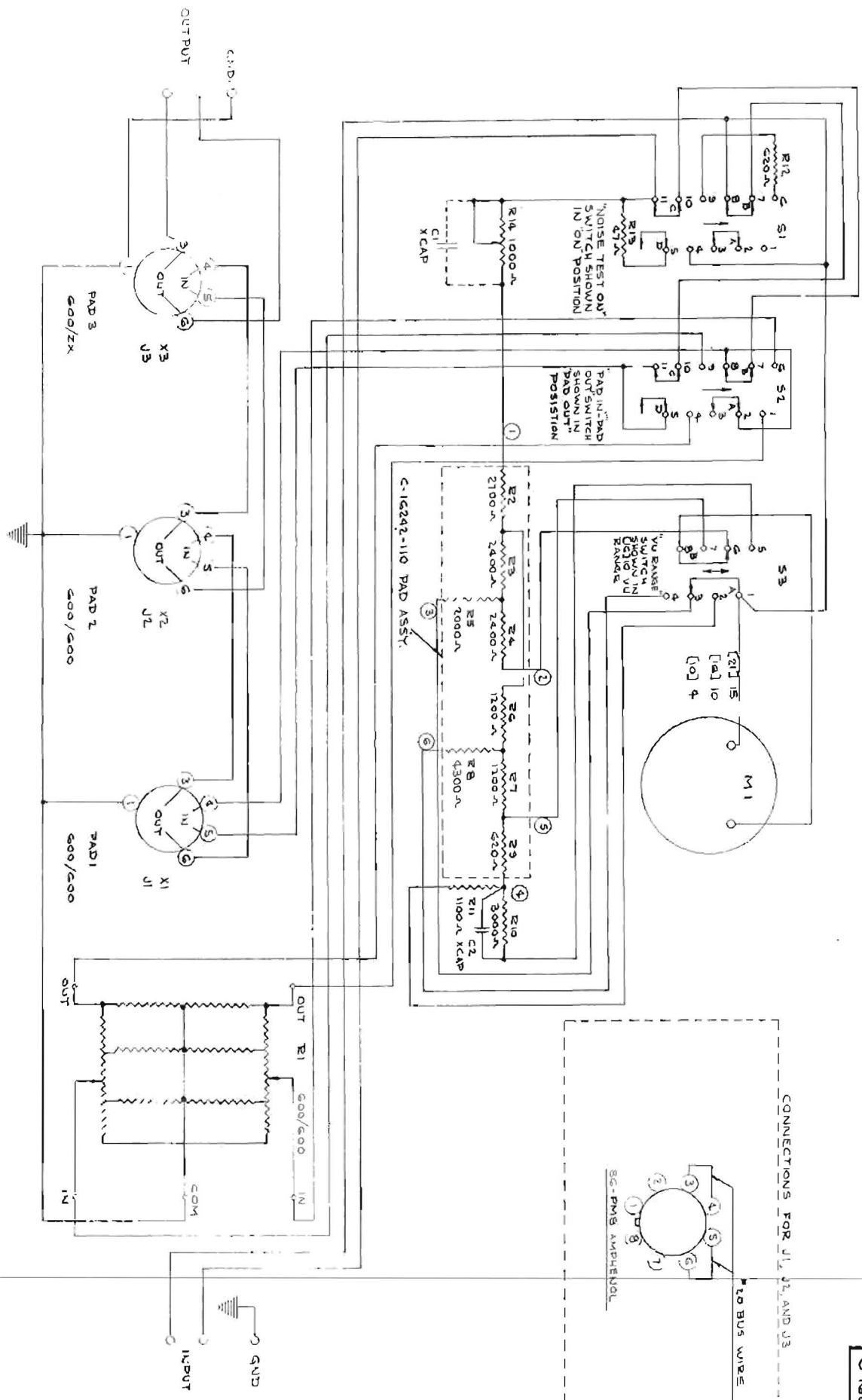
<u>Symbol No.</u>	<u>Gates Part No.</u>	<u>Description</u>
C1,C2		X-Capacitor (determined by frequency)
J1,J2, J3	610 0256 000	86 PM8 Connector
M1	630 0073 000	VU Meter, -20 to +3 DB Scale (Scale B)
R1	554 0189 000	Type BAL-251-G, Balanced ladder 600/600 ohms, with detent added
R2	540 0342 000	Res., 2700 ohms, 1 W., 5%
R3,R4	540 0058 000	Res., 2400 ohms, 1/2 W., 5%
R5	540 0056 000	Res., 2000 ohms, 1/2 W., 5%
R6,R7	540 0051 000	Res., 1200 ohms, 1/2 W., 5%
R8	540 0064 000	Res., 4300 ohms, 1/2 W., 5%
R9	540 0044 000	Res., 620 ohms, 1/2 W., 5%
R10	540 0060 000	Res., 3000 ohms, 1/2 W., 5%
R11	540 0050 000	Res., 1100 ohms, 1/2 W., 5%
R12	540 0044 000	Res., 620 ohms, 1/2 W., 5%
R13	540 0017 000	Res., 47 ohms, 1/2 W., 5%
R14	552 0545 000	Control, 1000 ohms, wirewound
S1,S2	602 0007 000	Switch
S3	602 0005 000	Switch
X1,X2,X3	404 0006 000	Socket, (Black)





DRAWING NUMBER  
**B-11474**

ADDED (C) PER E.C.N. 2139 6-28-50 J.L. 1	
<b>GATES RADIO COMPANY</b> QUINCY, ILLINOIS	
<b>LINE DIAGRAM NO-3625</b> GAIN SET	
MATERIAL ON BY H.G.H. CH BY <i>[Signature]</i>	DATE 4-21-50 ENG. REP
SCALE	
DRAWING NUMBER <b>B-11474</b>	



NOTE: PAD 3 IS USED PRIMARILY FOR IMPEDANCE MATCHING.  
WHEN MATCHING FROM 600 TO ANY OTHER IMPEDANCE  
ITS LOSS IS 20 DB.

REVISIONS		DRAWN BY		CHECKED BY		DATE	
NO.	DESCRIPTION	NO.	DATE	NO.	DATE	NO.	DATE
5	REDRAWN						
4	53-54 AWC						
3	ECCN # 2510						
2	214-51 D.L						
1	ECCN # 2139						
	5-28-50 DL						
	ECCN # 2210						
	4-20-50 D.L						
	ECCN # 1038						
	5-2-50						

WARRANTY ON PRODUCT GUARANTEE		GAIN SET		SCHEMATIC		PART NO.	
Model	Production	Model	Production	Model	Production	Model	Production
QD W 4	± 1/128	± .005					
ADORN 4 to 8	± 1/64	± .003					
ADORN 1 to 3	± 1/32	± .002					
ADORN 2A	± 1/16	± .001					

MATL	FIN.	
DRAWN BY ZLW		
DATE 2-10-50		
CHECKED BY H.F.F.		
DATE		
GATES RADIO COMPANY		
QUINCY, ILLINOIS		
C-16870		