

Speaker NSN6054A 12W 12VDC (8-15 volt DC).

Nato stock number: 5820-22-307-9221



MOTOROLA INC.

**NSN6054A
12W SPEAKER**

1. DESCRIPTION

The Model NSN6054A 12W speaker provides an increased audio output level for high-noise level areas. It is designed for use with the Vehicular Adapter. The user can adjust the audio level to that most suitable to override the surrounding noise level regardless of the volume setting on the portable radio in the Vehicular Adapter. The portable radio's volume level can remain adjusted for best audio as needed when worn on the belt. There is no need to adjust and readjust the volume setting each time the radio is taken in and out of the vehicle.

The assembly consists of an audio amplifier board, a weatherproof speaker, and a 25 DB pin connector cable. The 3.2 Ω , five-inch speaker is capable of handling up to 12 watts of audio.

2. INSTALLATION

The audio amplifier-speaker includes a trunnion bracket, hanger bracket, and wall-mount bracket which permits the speaker to be mounted in a variety of ways. The trunnion bracket is used to permanently mount the speaker to the dashboard or accessible firewall areas, yet permitting the speaker to be tilted or angled. The hanger bracket permits temporary mounting, such as on an automobile window. The speaker must be removed from the trunnion bracket to use the hanger bracket. The wall-mount bracket can be used for permanent mounting if the trunnion bracket is too large to fit in the desired area. In this instance, the trunnion bracket is removed and the speaker is attached to the wall-mount bracket by the hanger bracket. Refer to Figure 1 for installation information. Perform the following procedures:

a. Using the speaker trunnion bracket as a template, drill the necessary mounting holes and secure the bracket with the self-tapping screws provided.

b. Position the audio amplifier-speaker onto the trunnion bracket, and secure it using the wing screws supplied.

c. Plug the 25DB pin connector into the back of the Vehicular Adapter and tighten both screws to 3in/lbs.

d. Secure strain relief (S" hook) to the Vehicular Adapter.

3. HANDLING PRECAUTIONS

To avoid damage to circuits, observe the following handling, shipping, and servicing precautions.

a. Prior to and while servicing a Vehicular Adapter 12W speaker, particularly after moving within the service area, momentarily place both hands on a bare metal, earth-grounded surface. This will discharge any static charge which may have accumulated on the person doing the service.

NOTE

Wearing a conductive wrist strap (Motorola No. RSX-4015A) will minimize static buildup during servicing.

WARNING

When wearing a conductive wrist strap, be careful near high voltage sources. The good ground provided by the wrist strap will also increase the danger of lethal shock from accidentally touching high voltage sources.

b. Whenever possible, avoid touching any electrically conductive part of the unit with your hands.

c. When servicing a unit, avoid carpeted areas, dry environments, and certain types of clothing (silk, nylon, etc.) because they contribute to static buildup.

d. All electrically powered test equipment should be grounded. Apply the ground lead from the test equipment to the unit before connecting the test probe. Similarly, disconnect the test probe prior to removing the ground lead.

e. When soldering, be sure the soldering iron is grounded.

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**Instruction Manual
68P81108C39-0**

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4. THEORY OF OPERATION

(Refer to schematic diagram 63CB110BC43)

The audio output of the Vehicular Adapter is amplified by the two halves of a 12W differential audio amplifier (U1A and U1B). After amplification, it is fed to the drivers; the U1A output is fed to Q4 and Q5, and the U1B output is fed to Q10 and Q11. These further amplify the signal giving it more power gain. From there the audio signal is fed into final amplifiers Q6, Q7, Q8 and Q9 which drive the speaker.

The squelch input is fed through R6 to the base of Q3. When the radio is squelched, the base of Q3 is low allowing Q3 to remain in the off condition. If Q3 is off, it disables integrated circuit U1, and through transistors Q2, Q1, Q13, and Q12 shuts off the rest of the power amplifier circuit so that a minimum of current is drawn. When the receiver unsquelches, the dc level on the squelch input rises turning on Q3 and enabling integrated circuit U1. Transistor Q3 also enables Q1, Q2, Q12, and Q13 to bias the remaining circuitry up to its normal operating condition to amplify the incoming audio signal.

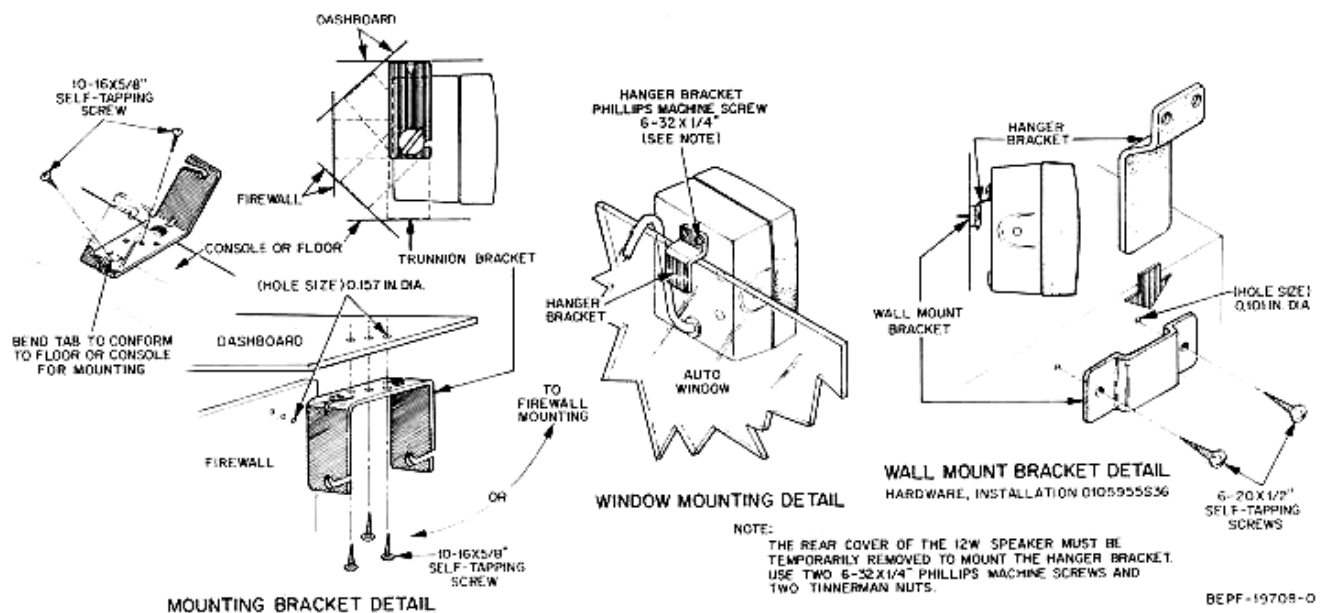
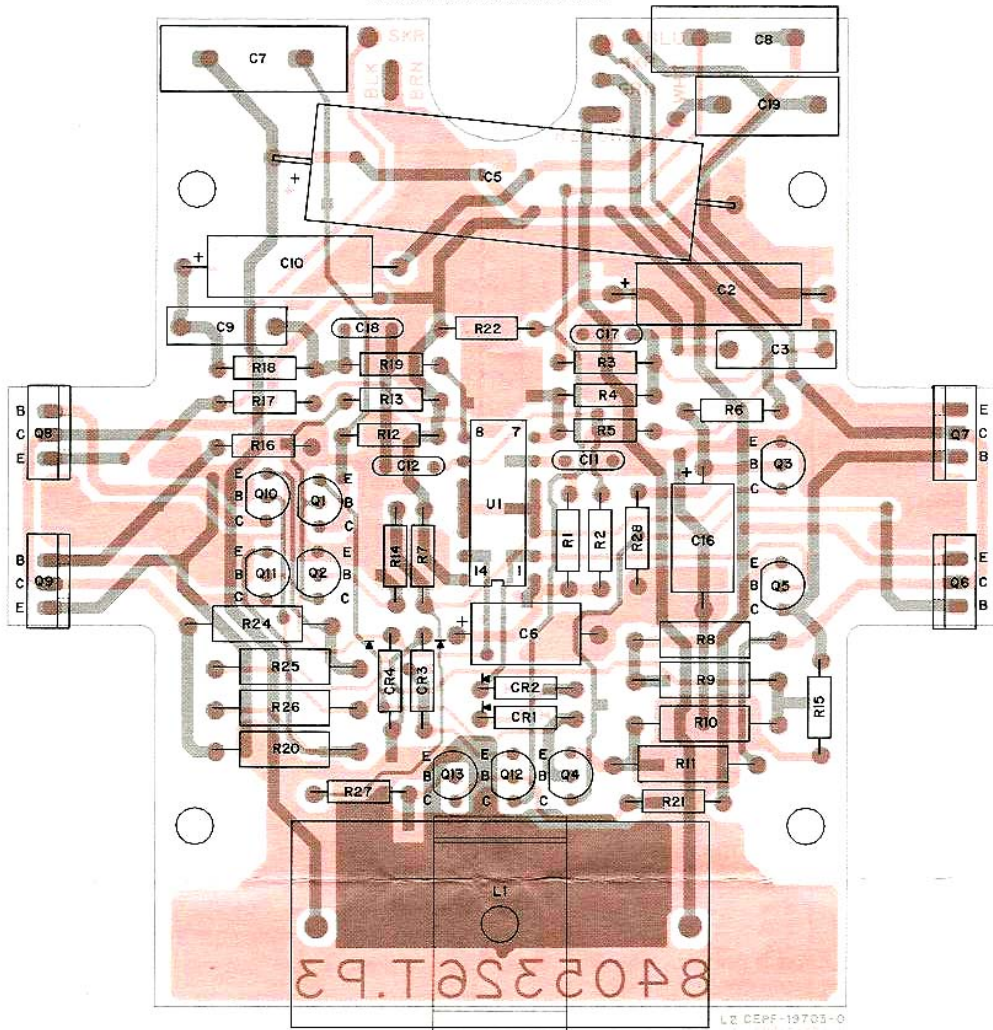


Figure 1. 12W Audio Amplifier-Speaker Installation Detail

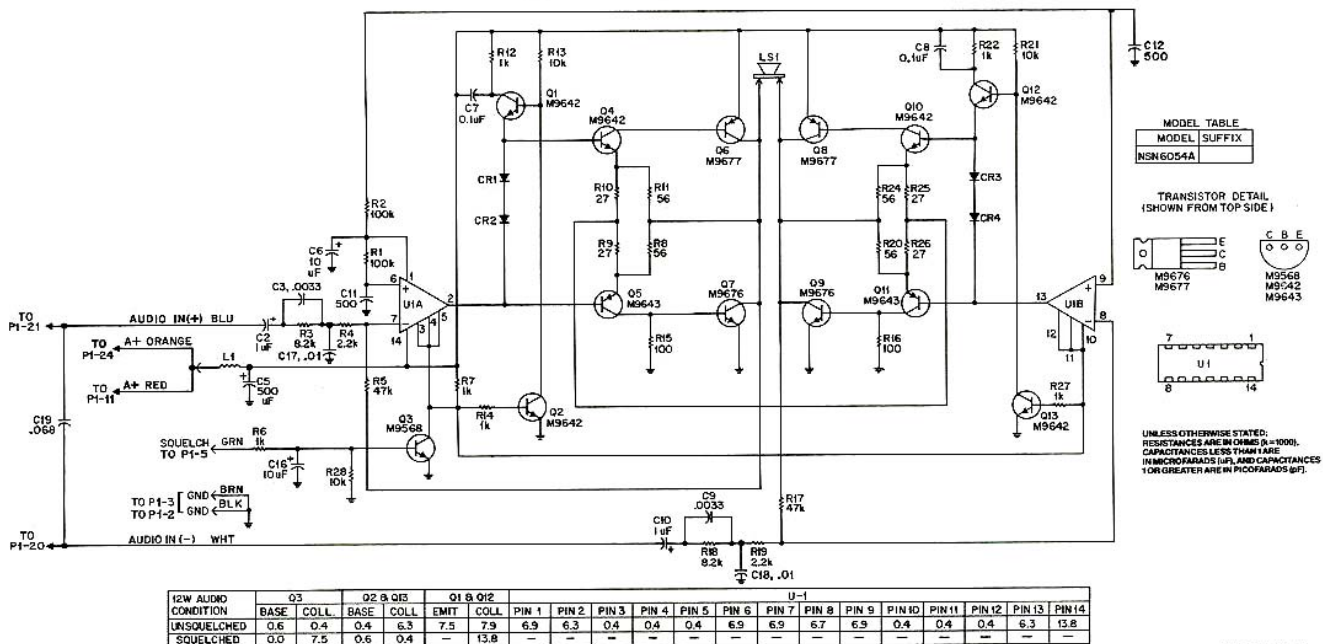
CIRCUIT BOARD DETAIL

VIEWED FROM COMPONENT SIDE



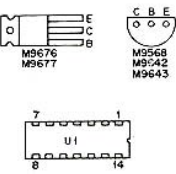
L2 CEPP-19703-0
OL CEPP-19705-0

SCHEMATIC DIAGRAM



MODEL	SUFFIX
NSN6054A	

TRANSISTOR DETAIL (SHOWN FROM TOP-SIDE)



UNLESS OTHERWISE STATED:
RESISTANCES ARE IN OHMS (K=1000),
CAPACITANCES LESS THAN 1000
IN MICROFARADS (UF), AND CAPACITANCES
100 OR GREATER ARE IN PICOFARADS (PF).

12W AUDIO CONDITION	Q2		Q2 & Q15		Q1 & Q12		U-1														
	BASE	COLL.	BASE	COLL.	EMIT	COLL.	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	PIN 13	PIN 14	
UN-SQUELCHED	0.6	0.4	0.4	6.3	7.5	7.9	6.9	6.3	0.4	0.4	0.4	6.9	6.7	6.9	0.4	0.4	0.4	6.3	13.8		
SQUELCHED	0.0	7.5	0.6	0.4	-	13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

63081108C43-0

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C1	----	CAPACITOR,Fixed: uF±10%;25V unless stated Not Used
C2	2382256J04	1;100V
C3	0882096J25	.0033;160V
C4	----	Not Used
C5	2383210A19	500-10+100%;20V
C6	2382256J03	10-10+50%
C7,8	0882905G07	0.1;50V
C9	0882096J25	.0033;160V
C10	2382256J04	1;100V
C11,12	2183162H08	500pF;100V
C13 thru 15	----	Not Used
C16	2382256J03	10-10+50%
C17,18	2105457G14	.01uF+30-80%; 63V
C19	0882905G04	.068uF;50V
CR1 thru 4	4883654H01	DIODE,Silicon See Note
L1	2582180B01	CHOKE
LS1	5080135E02	SPEAKER: 5"P.M., 3.2Ω
Q1,2	4800869642	TRANSISTOR: See Note
Q3	4800869568	NPN; type M9642
Q4	4800869642	NPN; type M9568
Q5	4800869643	NPN; type M9642
Q6	4800869643	PNP; type M9643
Q7	4800869677	PNP; type M9677
Q8	4800869676	NPN; type M9676
Q9	4800869677	PNP; type M9677
Q10	4800869676	NPN; type M9676
Q11	4800869642	NPN; type M9642
Q12,13	4800869643	PNP; type M9643
		NPN; type M9642
R1,2	0611009C97	RESISTOR,Fixed: Ω ±5%; 1/4W unless stated
R3	0611009C71	100k
R4	0611009C71	8.2k
R5	0611009C57	2.2k
R6	0611009C89	47k
R6,7	0611009C49	1k
R8	0611025A19	56;1/2W
R9,10	0611025A11	27;1/2W
R11	0600125A19	56; 1/2W
R12	0611009C49	1k
R13	0611009C73	10k
R14	0611009C49	1k
R15,16	0611009C25	100
R17	0611009C89	47k
R18	0611009C71	8.2k
R19	0611009C57	2.2k
R20	0611025A19	56;1/2W
R21	0611009C73	10k
R22	0611009C49	1k
R23	----	Not Used
R24	0611025A19	56;1/2W
R25,26	0611025A11	27; 1/2W
R27	0611009C49	1k
R28	0611009C73	10k
U1	5184320A99	INTEGRATED CIRCUIT: Dual Operational Amplifier

NONREFERENCED ITEMS	
0300122960	SCREW, Mach; 6-32x1/4"
0300136774	SCREW, Mach; 4-40x1/4"
0305177E01	SCREW, Captive
0384244C01	THUMB SCREW
0400847649	WASHER, Ins. 3/4"
0410057A13	WASHER, Ins. Shoulder
0705152E01	BRACKET, Trunnion
1305178E02	BEZEL, Speaker
1405329Q02	INSULATOR (for Q6 thru Q9)
1505919D04	COVER, Rear
3005443T01	CABLE, P/A Speaker
3284564B01	GASKET, Speaker
3305314P13	PLATE, Serial
4282018H08	RETAINER, Cable

NOTE: For optimum performance, order replacement diodes and transistors by Motorola part number only.