The Model 659 Amplifier Module is a low-noise, self-contained amplifier package which may have either fixed or adjustable gain. Gain can be controlled by selection of the resistance in the feedback loop. The maximum recommended voltage gain is 40 db. The amplifier delivers 60 milliwatts into 600 ohms, 100 milliwatts into 300 ohms, or more than 6 volts into any impedance above 600 ohms.

An output impedance of 5 ohms or less makes the amplifier ideal for working into long lines with minimum hum pickup and loss of high frequencies.

In addition to providing for adjustable gain, the open feedback loop permits the insertion of equalizing networks or tuned circuits for selective amplification.

The Model 659 has welded and encapsulated circuit components for high level environmental protection. All transistors are mounted in molded-in sockets to provide versatility and simplicity of transistor replacement. This feature permits transistors to be substituted or selected for greater temperature stability, increased frequency response or greater signal-to-noise ratio.

Some typical uses for the Allison 659 are: (1) As a driver-amplifier for a meter rectifier system, recorder or counter; (2) As a telephone line amplifier; (3) As a selective amplifier. The 659 can be combined with the Allison Model 660 Preamplifier and the Model 671 Meter System to form a voltmeter with sensitivity as great as .001 volts rms full scale meter reading and frequency response flat from 10 cps to 400 kcps.

**FEATURES**

- Low Noise • Fixed or Adjustable Gain
- Wide Bandwidth • Wide Dynamic Range
- Selective Amplification • Miniature
- Low Output Impedance • Solid State
- Non-Microphonic • Welded Construction
- Service-Free Operation • Low Cost
- Encapsulated • High Input Impedance
- Shock and Vibration Resistant

**TYPICAL PHASE SHIFT**

<table>
<thead>
<tr>
<th>COMMON</th>
<th>2N1505</th>
<th>2N1502</th>
<th>2N1505</th>
<th>2N1502</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT</td>
<td>OUTPUT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PRICES AND DELIVERY**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1·4</td>
<td>$37.50</td>
</tr>
<tr>
<td>5·9</td>
<td>$33.50</td>
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<tr>
<td>10·24</td>
<td>$31.25</td>
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<tr>
<td>25·49</td>
<td>$29.50</td>
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<tr>
<td>50·100</td>
<td>$27.80</td>
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</tbody>
</table>

DELIVERY - STOCK TO 10 DAYS

F.O.B. - LA HABRA

See reverse side of sheet for full electrical and mechanical specifications, prices, and delivery information.

**Allison Laboratories, Inc.**

POST OFFICE BOX 515 • LA HABRA, CALIFORNIA
MODEL 659 SPECIFICATIONS

OUTLINE AND MOUNTING DIMENSIONS

LEADS No. 20 BERYLLIUM COPPER PLATED

30 db 600 ohms

6.0 6.0 6.0 6.0

FREQUENCY RESPONSE

Low End: Flat Midband to 10 cps ±0.6 db
High End: (Dependent upon gain as shown)

Voltage Gain —1 db point
22.5 30 db 400 KCPS (Min.)
22.5 40 db 100 KCPS (Min.)

HARMONIC DISTORTION

Taken at 1 KCPS and —3 db from overload

22.5 VDC

30 db 40 db

2nd 3rd 2nd 3rd
.15% .11% .25% .20%

INTERMODULATION DISTORTION

400 CPS and 4000 CPS mixed 4:1

22.5 VDC

30 db 40 db

1.0% 1.0%

EQUIVALENT INPUT NOISE (MV)

22.5 VDC

30 db 40 db

S O S O
0.35 5.9 1.0 16.2

S = Shorted Input
O = Open Input
Taken at 25°C and Bandwidth limited to 35 KCPS

OUTPUT VOLTAGE

(Maximum for ½ db below overload)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>30 db</th>
<th>40 db</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Load</td>
<td>600 ohms</td>
<td>No Load</td>
</tr>
<tr>
<td>6.0</td>
<td>6.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

WEIGHT 1.7 oz.

GAIN AT 1 KCPS
30 db to 40 db (operation below 25 db is not recommended).

GAIN STABILITY
Constant ±.5 db from 0°C to 50°C.

LOAD IMPEDANCE: Minimum recommended load impedance is 600 ohms. Amplifier will not be damaged by loads down to 200 ohms with input voltages up to 2.0 volts RMS.

AVERAGE CURRENT
Average no signal current is 2.2 ma. Current goes up to 17 ma with maximum signal output (depending upon load).

SIGNAL-TO-NOISE RATIO
90 db with 40 db gain and 22.5 VDC (input shorted).

IMPEDANCE

<table>
<thead>
<tr>
<th>Input (Minimum)</th>
<th>Output (Maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 db</td>
<td>40 db</td>
</tr>
<tr>
<td>40K</td>
<td>40K</td>
</tr>
</tbody>
</table>

2 ohms 2 ohms

NOTES: Temperature variation of 0° to 50°C. will cause negligible change.