

### SYSTEM PREAMPLIFIER FOR SINGLE CASSETTE DECK

The KIA2068N is system preamplifier IC for single deck radio-cassette tape player. This IC have built-in function for single cassette deck and mixing amp for KARAOKE and function switch for source selector.

#### FEATURE

- Dual channel.
- Built-in EQ amp, REC amp, Monitor amp, Mic(Mixing) amp.
- Mic amp is suitable for both inner mic and mixing mic.
- Built-in source selector switch : RADIO-IN/TAPE-IN/AUX-IN
- 6-operation mode are available for INNER MIC set and MIXING MIC set.

##### <INNER MIC SET>

- 1) TAPE PLAY-BACK
- 2) LINE-IN PLAY
- 3) RADIO PLAY
- 4) MIC RECORDING without MONITOR
- 5) LINE-IN RECORDING AND PLAY
- 6) RADIO RECORDING AND PLAY

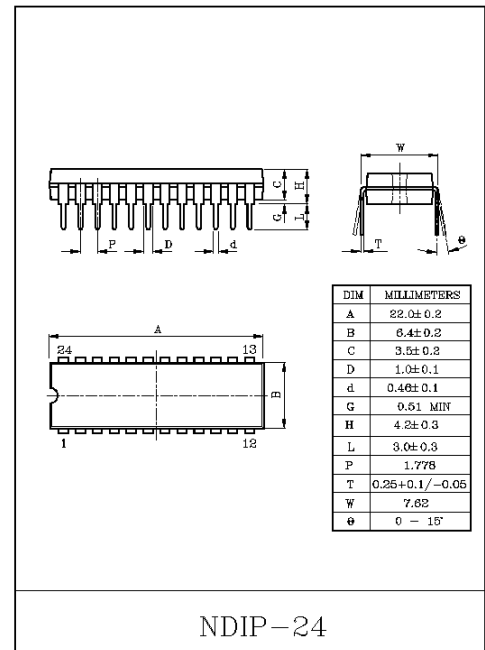
##### <MIXING MIC SET>

- 1) TAPE PLAY-BACK with MIC MIXING
  - 2) LINE-IN PLAY with MIC MIXING
  - 3) RADIO PLAY with MIC MIXING
  - 4) MIC RECORDING with MONITOR
  - 5) LINE-IN RECORDING AND PLAY with MIC MIXING
  - 6) RADIO RECORDING AND PLAY with MIC MIXING
- Operating Voltage Range  
:  $V_{CC(oper)}=4.0\sim 9.0V$  ( $T_a=25^\circ C$ )

#### MAXIMUM RATINGS ( $T_a=25^\circ C$ )

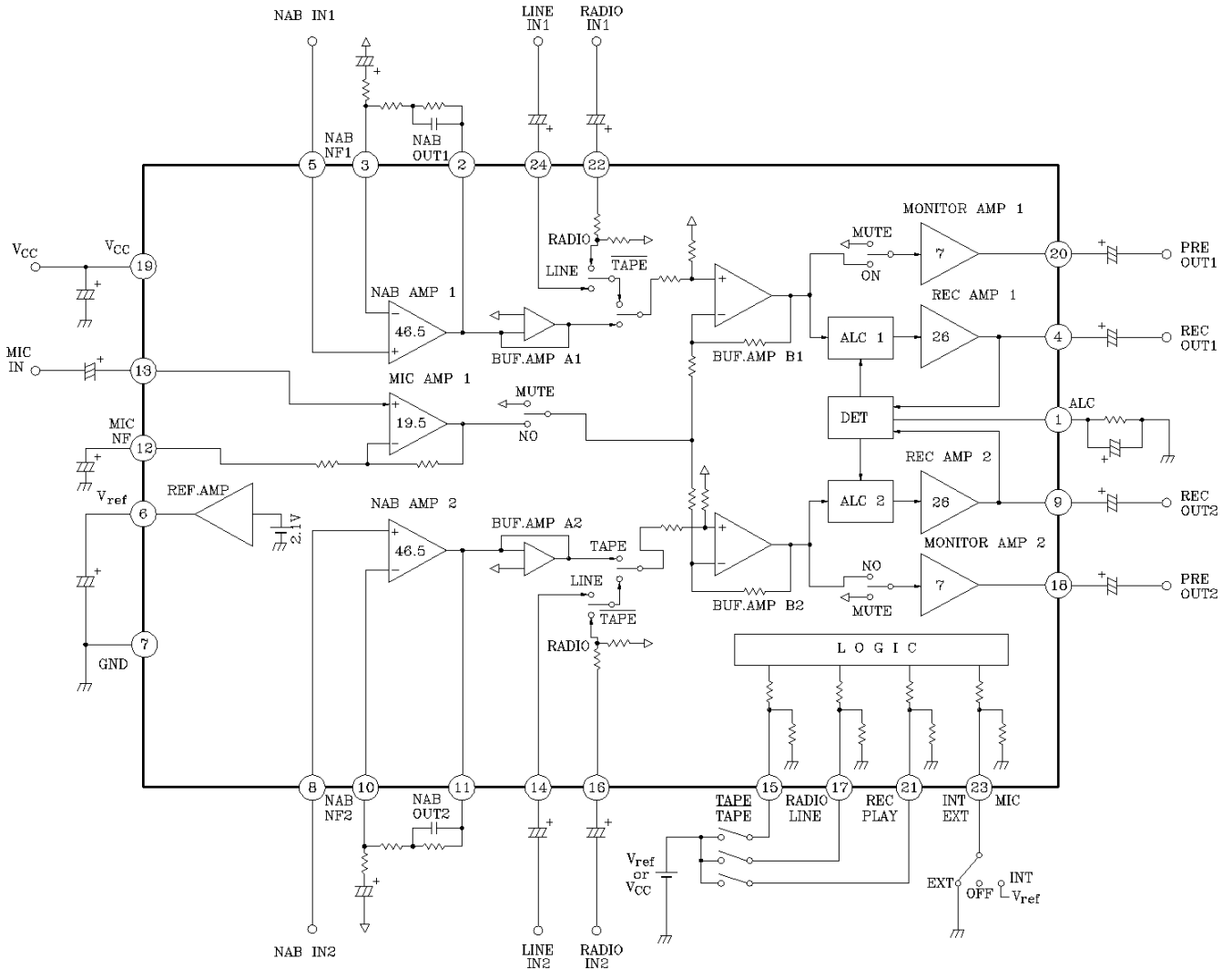
| CHARACTERISTIC        | SYMBOL    | RATING   | UNIT |
|-----------------------|-----------|----------|------|
| Supply Voltage        | $V_{CC}$  | 9        | V    |
| Power Dissipation     | $P_D$     | 1200     | mW   |
| Operating Temperature | $T_{opr}$ | -25~+75  | °C   |
| Storage Temperature   | $T_{stg}$ | -55~+150 |      |

Note : Derated above  $T_a=25^\circ C$ , in the proportion of 9.6mW/°C.



# KIA2068N

## BLOCK DIAGRAM



# KIA2068N

## ELECTRICAL CHARACTERISTICS

(Unless otherwise specified,  $V_{CC}=5V$ ,  $f=1kHz$ ,  $T_a=25^{\circ}C$ )

| CHARACTERISTIC        |                                | SYMBOL                    | TEST CONDITION      | MIN.  | TYP. | MAX.      | UNIT |           |
|-----------------------|--------------------------------|---------------------------|---------------------|---|------|-----------|------|-----------|
| Quiescent Current     |                                | $I_{CCQ1}$                | REC MODE            | 6.0   | 10.0 | 16.0      | mA   |           |
|                       |                                | $I_{CCQ2}$                | PLAY MODE           | 4.0   | 7.5  | 13.0      |      |           |
| Reference Voltage     |                                | $V_{REF}$                 |                     | -   | 2.1  | -         | V    |           |
| CONTROL VOLTAGE RANGE | TAPE/TAPE SW<br>(SW1 : pin15)  | $V_{TH1A}$                | TAPE MODE (OPEN)    | 0   | -    | 0.2       | V    |           |
|                       |                                | $V_{TH1B}$                | TAPE MODE           | 1.3   | -    | $V_{CC}$  |      |           |
|                       | RADIO/LINE SW<br>(SW2 : pin17) | $V_{TH2A}$                | RADIO MODE (OPEN)   | 0   | -    | 0.2       |      |           |
|                       |                                | $V_{TH2B}$                | LINE MODE           | 1.3   | -    | $V_{CC}$  |      |           |
|                       | REC/PLAY SW<br>(SW3 : pin21)   | $V_{TH3A}$                | PLAY MODE (OPEN)    | 0   | -    | 0.2       |      |           |
|                       |                                | $V_{TH3B}$                | REC MODE            | 1.3   | -    | $V_{CC}$  |      |           |
|                       | MIC SW<br>(SW4 : pin23)        | $V_{TH4A}$                | EXT. MIC MODE       | 0   | -    | 0.2       |      |           |
|                       |                                | $V_{TH4B}$                | MIC OFF MODE (OPEN) | -   | OPEN | -         |      |           |
|                       |                                | $V_{TH4C}$                | INT. MIC MODE       | 1.6   | -    | $V_{ref}$ |      |           |
| RADIO MODE            | PLAY BACK                      | Voltage Gain              | $G_{v1}$            | $V_{OUT}=-10dBV$  | -4   | -2        | 0    | dB        |
|                       |                                | Maximum Output Voltage    | $V_{OM1}$           | THD=1%  | -    | 1.2       | -    | $V_{RMS}$ |
|                       |                                | Output Noise Voltage      | $V_{no1}$           | MIC OFF MODE, $R_g=620\Omega$ ,<br>DIN AUDIO              | -    | -98       | -    | dBV       |
|                       |                                | Total Harmonic Distortion | THD 1               | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                         | -    | 0.2       | -    | %         |
|                       |                                | Cross Talk                | C.T.1               | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                         | -    | -60       | -    | dB        |
|                       |                                | Ripple Rejection Ratio    | R.R.1               | MIC OFF MODE, $V_{rip}=-20dBV$ ,<br>$f=100Hz$ , BW=~30kHz | -    | -52       | -    | dB        |
|                       | REC                            | Voltage Gain              | $G_{v2}$            | $V_{OUT}=-10dBV$  | 15   | 17        | 19   | dB        |
|                       |                                | Output Noise Voltage      | $V_{no2}$           | MIC OFF MODE, $R_g=620\Omega$ ,<br>DIN AUDIO              | -    | -77       | -    | dBV       |
|                       |                                | Total Harmonic Distortion | THD 2               | $V_{IN}=-6dBV$ , ALC=ON<br>BW=400~30kHz                   | -    | 0.3       | -    | %         |
|                       |                                | Cross Talk                | C.T.2               | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                         | -    | -57       | -    | dB        |
|                       |                                | Ripple Rejection Ratio    | R.R.2               | INT. MIC MODE $V_{rip}=-20dBV$ ,<br>$f=100Hz$ , BW=~30kHz | -    | -40       | -    | dB        |
|                       |                                | ALC Level                 | ALC 21              | $V_{IN}=-16dBV$   | -4   | -2        | 0    | dBV       |
|                       | ALC 22                         | $V_{IN}=4dBV$             | -4                  | -1  | 2    |           |      |           |
|                       |                                |                           | Dual Channel Input  |   |      |           |      |           |
| LINE MODE             | PLAY BACK                      | Voltage Gain              | $G_{v3}$            | $V_{OUT}=-10dBV$  | 5    | 7         | 9    | dB        |
|                       |                                | Maximum Output Voltage    | $V_{OM3}$           | THD=1%  | -    | 1.2       | -    | $V_{RMS}$ |
|                       |                                | Output Noise Voltage      | $V_{no3}$           | MIC OFF MODE, $R_g=620\Omega$<br>DIN AUDIO                | -    | -98       | -    | dBV       |
|                       |                                | Total Harmonic Distortion | THD 3               | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                         | -    | 0.2       | -    | %         |
|                       |                                | Cross Talk                | C.T.3               | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                         | -    | -60       | -    | dB        |
|                       |                                | Ripple Rejection Ratio    | R.R.3               | MIC OFF MODE $V_{rip}=-20dBV$ ,<br>$f=100Hz$ , BW=~30kHz  | -    | -52       | -    | dB        |
|                       | REC                            | Voltage Gain              | $G_{v4}$            | $V_{OUT}=-10dBV$  | 24   | 26        | 28   | dB        |
|                       |                                | Output Noise Voltage      | $V_{no4}$           | MIC OFF MODE, $R_g=620\Omega$<br>DIN AUDIO                | -    | -77       | -    | dBV       |
|                       |                                | Total Harmonic Distortion | THD 4               | $V_{IN}=-16dBV$ , ALC=ON<br>BW=400Hz~30kHz                | -    | 0.3       | -    | %         |
|                       |                                | Cross Talk                | C.T.4               | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                         | -    | -56       | -    | dB        |
|                       |                                | Ripple Rejection Ratio    | R.R.4               | MIC OFF MODE, $V_{rip}=-20dBV$ ,<br>$f=100Hz$ , BW=~30kHz | -    | -37       | -    | dB        |
|                       |                                | ALC Level                 | ALC 41              | $V_{IN}=-26dBV$   | -4   | -2        | 0    | dBV       |
|                       | ALC 42                         | $V_{IN}=-6dBV$            | -4                  | -1  | 2    |           |      |           |
|                       |                                |                           | Dual Channel Input  |   |      |           |      |           |

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## ELECTRICAL CHARACTERISTICS

(Unless otherwise specified,  $V_{CC}=5V$ ,  $f=1kHz$ ,  $T_a=25^\circ C$ )

| CHARACTERISTIC |                           | SYMBOL                    | TEST CONDITION  | MIN.   | TYP.               | MAX. | UNIT      |           |
|----------------|---------------------------|---------------------------|---|--|--------------------|------|-----------|-----------|
| TAPE MODE      | Open Loop Voltage Gain    | $G_{VO5}$                 | $V_{OUT}=-10dBV$  | -  | 97                 | -    | dB        |           |
|                | Closed Loop Voltage Gain  | $G_V5$                    | $V_{OUT}=-10dBV$  | 41.5   | 43.5               | 45.5 |           |           |
|                | Maximum Output Voltage    | $V_{OM5}$                 | THD=1%  | -  | 1.2                | -    | $V_{rms}$ |           |
|                | Output Noise Voltage      | $V_{no5}$                 | INT. MIC MODE, $R_g=620\Omega$ ,<br>DIN AUDIO             | -  | -73                | -    | dBV       |           |
|                | Total Harmonic Distortion | THD 5                     | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                         | -  | 0.2                | -    | %         |           |
|                | Cross Talk                | C.T.5                     | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                         | -  | 57                 | -    | dB        |           |
|                | Ripple Rejection Ratio    | R.R.5                     | MIC OFF MODE, $V_{rip}=-20dBV$ ,<br>$f=100Hz$ , BW=~30kHz | -  | -33                | -    | dB        |           |
| MIC MODE       | PLAY BACK                 | Voltage Gain              | $G_V6$  | $V_{OUT}=-10dBV$   | 25.5               | 27.5 | 29.5      | dB        |
|                |                           | Maximum Output Voltage    | $V_{OM6}$   | THD=1%   | -                  | 1.2  | -         | $V_{rms}$ |
|                |                           | Output Noise Voltage      | $V_{no6}$   | EXT. MIC MODE, $R_g=620\Omega$<br>DIN AUDIO                            | -                  | -87  | -         | dBV       |
|                |                           | Total Harmonic Distortion | THD 6   | $V_{OUT}=-10dBV$ , BW=400Hz~30kHz                                      | -                  | 0.24 | -         | %         |
|                |                           | Ripple Rejection Ratio    | R.R.6   | INT. MIC MODE $V_{rip}=-20dBV$ ,<br>$f=100Hz$ , BW=~30kHz              | -                  | -52  | -         | dB        |
|                | REC                       | Voltage Gain              | $G_V7$  | $V_{OUT}=-10dBV$   | 44.5               | 46.5 | 48.5      | dB        |
|                |                           | Maximum Output Voltage    | $V_{OM7}$   | THD=1%, ALC=OFF  | -                  | 1.2  | -         | $V_{rms}$ |
|                |                           | Output Noise Voltage      | $V_{no7}$   | INT. MIC/EXT. MIC MODE,<br>$R_g=620\Omega$ , DIN AUDIO                 | -                  | -70  | -         | dBV       |
|                |                           | Total Harmonic Distortion | THD 7   | $V_{IN}=-36dBV$ , ALC=ON<br>BW=400Hz~30kHz                             | -                  | 0.3  | -         | %         |
|                |                           | Ripple Rejection Ratio    | R.R.7   | INT. MIC/EXT. MIC MODE,<br>$V_{rip}=-20dBV$ , $f=100Hz$ ,<br>BW=~30kHz | -                  | -47  | -         | dB        |
|                |                           | ALC Level                 | ALC 71  | $V_{IN}=-46dBV$  | Dual Channel Input | -4   | -2        | 0         |
| ALC 72         | $V_{IN}=-26dBV$           |                           | -4  | -1   |                    | 2    |           |           |

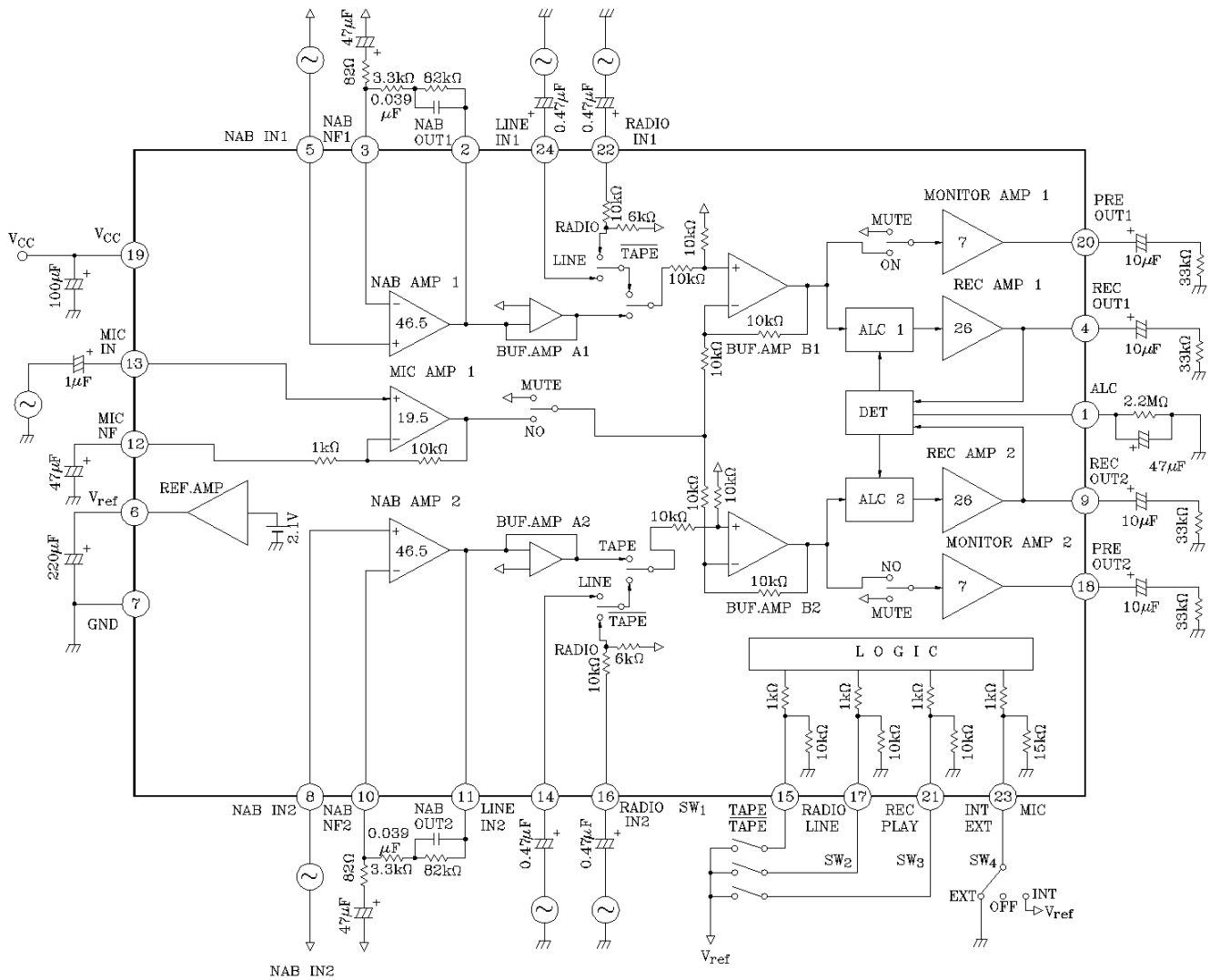
## DC VOLTAGE AT EACH TERMINAL

$V_{CC}=5V$ ,  $f=1kHz$ ,  $T_a=25^\circ C$

|                |                       |     |                 |     |             |     |               |     |
|----------------|-----------------------|-----|-----------------|-----|-------------|-----|---------------|-----|
| TERMINAL NO.   | 1                     | 2   | 3               | 4   | 5           | 6   | 7             | 8   |
| DC VOLTAGE [V] | 1.0(REC)<br>0.1(PLAY) | 2.1 | 2.1             | 2.1 | 2.1         | 2.1 | 0<br>GND      | 2.1 |
| TERMINAL NO.   | 9                     | 10  | 11              | 12  | 13          | 14  | 15            | 16  |
| DC VOLTAGE [V] | 2.1                   | 2.1 | 2.1             | 2.1 | 2.1         | 2.1 | 0<br>(OPEN)   | 2.1 |
| TERMINAL NO.   | 17                    | 18  | 19              | 20  | 21          | 22  | 23            | 24  |
| DC VOLTAGE [V] | 0<br>(OPEN)           | 2.1 | 5.0<br>$V_{CC}$ | 2.1 | 0<br>(OPEN) | 2.1 | 2.1<br>(OPEN) | 2.1 |

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## TEST CIRCUIT



\* 23PIN : For mic off mode, should be open.  
don't add any external voltage.

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## OPERATION MODE BY EXTERNAL SWITCH (1 OF 2)

| SW POSITION                | MIC MODE         | G:EXT MIC<br>O:MIC OFF<br>H:INT MIC | Vref<br>INTERNAL MIC MODE |       |       |       |                       |       |            |            | GND<br>EXTERNAL MIC MODE |       |            |             |                       |       |      |       |      |       |
|----------------------------|------------------|-------------------------------------|---------------------------|-------|-------|-------|-----------------------|-------|------------|------------|--------------------------|-------|------------|-------------|-----------------------|-------|------|-------|------|-------|
|                            | REC/<br>PLAY     | SW3(21)<br>O:PLAY<br>H:REC          | OPEN<br>PLAY BACK MODE    |       |       |       | Vcc<br>RECORDING MODE |       |            |            | OPEN<br>PLAY BACK MODE   |       |            |             | Vcc<br>RECORDING MODE |       |      |       |      |       |
|                            | SOURCE<br>SELECT | SW2(15)<br>O:TAPE<br>H:TAPE         | Vcc                       | OPEN  |       |       | Vcc                   | OPEN  |            |            | Vcc                      | OPEN  |            |             | Vcc                   | OPEN  |      |       |      |       |
|                            |                  | SW1(17)<br>O:LINE<br>H:RADIO        | Vcc                       | OPEN  | Vcc   | OPEN  | Vcc                   | OPEN  | Vcc        | OPEN       | Vcc                      | OPEN  | Vcc        | OPEN        | Vcc                   | OPEN  | Vcc  | OPEN  |      |       |
| OPERA-<br>TION<br>MODE     | INPUT/SOURCE     |                                     | TAPE                      | LINE  | RADIO | MIC   | LINE                  | RADIO | TAPE + MIC | LINE + MIC | RADIO + MIC              | MIC   | LINE + MIC | RADIO + MIC |                       |       |      |       |      |       |
|                            | MONITOR OUT      |                                     | ○                         | ○     | ○     |       | ○                     | ○     | ○          | ○          | ○                        | ○     | ○          | ○           | ○                     |       |      |       |      |       |
|                            | REC OUT          |                                     |                           |       |       | ○     | ○                     | ○     |            |            |                          | ○     | ○          | ○           |                       |       |      |       |      |       |
| INTERNAL<br>OPERA-<br>TION | NAB AMP          |                                     | ON                        | ON    | OFF   | OFF   | ON                    | ON    | OFF        | OFF        | ON                       | ON    | OFF        | OFF         |                       |       |      |       |      |       |
|                            | BUFFER AMP A     |                                     | OFF                       | OFF   | ON    | ON    | OFF                   | OFF   | ON         | ON         | OFF                      | OFF   | ON         | ON          |                       |       |      |       |      |       |
|                            | LINE/RADIO SW    |                                     | LINE                      | RADIO | LINE  | RADIO | LINE                  | RADIO | LINE       | RADIO      | LINE                     | RADIO | LINE       | RADIO       | LINE                  | RADIO | LINE | RADIO | LINE | RADIO |
|                            | TAPE/TAPE SW     |                                     | TAPE                      | TAPE  | TAPE  | TAPE  | TAPE                  | TAPE  | TAPE       | TAPE       | TAPE                     | TAPE  | TAPE       | TAPE        | TAPE                  | TAPE  | TAPE | TAPE  | TAPE | TAPE  |
|                            | MIC AMP          |                                     | MUTE                      | MUTE  | ON    | MUTE  | ON                    | MUTE  | ON         | MUTE       | ON                       | ON    | ON         | ON          | ON                    |       |      |       |      |       |
|                            | BUFFER AMP B     |                                     | ON                        | ON    | ON    | ON    | ON                    | ON    | ON         | ON         | ON                       | ON    | ON         | ON          | ON                    |       |      |       |      |       |
|                            | REC AMP          |                                     | OFF                       | OFF   | ON    | ON    | OFF                   | OFF   | ON         | ON         | OFF                      | OFF   | ON         | ON          | ON                    |       |      |       |      |       |
|                            | ALC CIRCUIT      |                                     | ON                        | ON    | ON    | ON    | ON                    | ON    | ON         | ON         | ON                       | ON    | ON         | ON          | ON                    |       |      |       |      |       |
|                            | ALC DISCHARGE    |                                     | ON                        | ON    | OFF   | OFF   | ON                    | ON    | OFF        | OFF        | ON                       | ON    | OFF        | OFF         | ON                    |       |      |       |      |       |
| MONITOR AMP                |                  | ON                                  | ON                        | MUTE  | ON    | ON    | ON                    | ON    | ON         | ON         | ON                       | ON    | ON         | ON          |                       |       |      |       |      |       |

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## OPERATION MODE BY EXTERNAL SWITCH (2 OF 2)

|                    |               |                                     |                        |       |                          |       |                                   |       |                          |       |
|--------------------|---------------|-------------------------------------|------------------------|-------|--------------------------|-------|-----------------------------------|-------|--------------------------|-------|
| SW POSITION        | MIC MODE      | G:EXT MIC<br>O:MIC OFF<br>H:INT MIC | OPEN<br>MIC OFF MODE   |       |                          |       |                                   |       |                          |       |
|                    | REC/PLAY      | SW3(21)<br>O:PLAY<br>H:REC          | OPEN<br>PLAY BACK MODE |       |                          |       | V <sub>CC</sub><br>RECORDING MODE |       |                          |       |
|                    | SOURCE SELECT | SW2(15)<br>O:TAPE<br>H:TAPE         | V <sub>CC</sub>        |       | OPEN                     |       | V <sub>CC</sub>                   |       | OPEN                     |       |
|                    |               | SW1(17)<br>O:LINE<br>H:RADIO        | V <sub>CC</sub>        | OPEN  | V <sub>CC</sub>          | OPEN  | V <sub>CC</sub>                   | OPEN  | V <sub>CC</sub>          | OPEN  |
| OPERATION MODE     | INPUT/SOURCE  |                                     | TAPE                   |       | LINE                     | RADIO | MIC                               |       | LINE                     | RADIO |
|                    | MONITOR OUT   |                                     | ○                      | ○     | ○                        |       |                                   |       | ○                        | ○     |
|                    | REC OUT       |                                     |                        |       |                          |       |                                   |       | ○                        | ○     |
| INTERNAL OPERATION | NAB AMP       |                                     | ON                     |       | ON                       |       | OFF                               |       | OFF                      |       |
|                    | BUFFER AMP A  |                                     | OFF                    |       | OFF                      |       | ON                                |       | ON                       |       |
|                    | LINE/RADIO SW |                                     | LINE                   | RADIO | LINE                     | RADIO | LINE                              | RADIO | LINE                     | RADIO |
|                    | TAPE/TAPE SW  |                                     | TAPE                   |       | $\overline{\text{TAPE}}$ |       | TAPE                              |       | $\overline{\text{TAPE}}$ |       |
|                    | MIC AMP       |                                     | MUTE                   |       | MUTE                     |       | MUTE                              |       | MUTE                     |       |
|                    | BUFFER AMP B  |                                     | ON                     |       | ON                       |       | ON                                |       | ON                       |       |
|                    | REC AMP       |                                     | OFF                    |       | OFF                      |       | ON                                |       | ON                       |       |
|                    | ALC CIRCUIT   |                                     | ON                     |       | ON                       |       | ON                                |       | ON                       |       |
|                    | ALC DISCHARGE |                                     | ON                     |       | ON                       |       | OFF                               |       | OFF                      |       |
| MONITOR AMP        |               | ON                                  |                        | ON    |                          | ON    |                                   | ON    |                          |       |

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## SWITCH MODE EXPLANATION

| FUNCTION   |           |               | SWITCH MODE COMBINATION |       |       |     | INPUT | INPUT RESISTANCE<br>R <sub>g</sub> | OUTPUT AMPLIFIER |
|------------|-----------|---------------|-------------------------|-------|-------|-----|-------|------------------------------------|------------------|
|            |           |               | SW4                     | SW3   | SW2   | SW1 |       |                                    |                  |
| RADIO MODE | PLAY-BACK | *W.O Vno, R.R | L / O                   | O / H | H     | O   | RADIO | -                                  | MONITOR          |
|            |           | Vno 11        | O                       | O / H | H     | O   | -     | RADIO                              | MONITOR          |
|            |           | Vno 12        | L                       | O / H | H     | O   | -     | RADIO / MIC                        | MONITOR          |
|            |           | R.R 11        | O                       | O / H | H     | O   | -     | RADIO                              | MONITOR          |
|            |           | R.R 12        | L                       | O / H | H     | O   | -     | RADIO / MIC                        | MONITOR          |
|            | REC       | *W.O Vno, R.R | L / O                   | H     | H     | O   | RADIO | -                                  | REC              |
|            |           | Vno 21        | O                       | H     | H     | O   | -     | RADIO                              | REC              |
|            |           | Vno 22        | L                       | H     | H     | O   | -     | RADIO / MIC                        | REC              |
|            |           | R.R 21        | O                       | H     | H     | O   | -     | RADIO                              | REC              |
|            |           | R.R 22        | L                       | H     | H     | O   | -     | RADIO / MIC                        | REC              |
| LINE MODE  | PLAY-BACK | *W.O Vno, R.R | L / O                   | O / H | O     | O   | LINE  | -                                  | MONITOR          |
|            |           | Vno 31        | O                       | O / H | O     | O   | -     | LINE                               | MONITOR          |
|            |           | Vno 32        | L                       | O / H | O     | O   | -     | LINE / MIC                         | MONITOR          |
|            |           | R.R 31        | O                       | O / H | O     | O   | -     | LINE                               | MONITOR          |
|            |           | R.R 32        | L                       | O / H | O     | O   | -     | LINE / MIC                         | MONITOR          |
|            | REC       | *W.O Vno, R.R | L / O                   | H     | O     | O   | LINE  | -                                  | REC              |
|            |           | Vno 41        | O                       | H     | O     | O   | -     | LINE                               | REC              |
|            |           | Vno 42        | L                       | H     | O     | O   | -     | LINE / MIC                         | REC              |
|            |           | R.R 41        | O                       | H     | O     | O   | -     | LINE                               | REC              |
|            |           | R.R 42        | L                       | H     | O     | O   | -     | LINE / MIC                         | REC              |
| TAPE MODE  |           | *W.O Vno, R.R | L / O                   | O     | O / H | H   | TAPE  | -                                  | MONITOR          |
|            |           | Vno 51        | O                       | O     | O / H | H   | -     | TAPE                               | MONITOR          |
|            |           | Vno 52        | L                       | O     | O / H | H   | -     | TAPE / MIC                         | MONITOR          |
|            |           | R.R 51        | O                       | O     | O / H | H   | -     | TAPE                               | MONITOR          |
|            |           | R.R 52        | L                       | O     | O / H | H   | -     | TAPE / MIC                         | MONITOR          |
| MIC MODE   | PLAY-BACK | *W.O Vno, R.R | L                       | H     | O / H | H   | MIC   | -                                  | MONITOR          |
|            |           | Vno 6         | L                       | H     | O / H | H   | -     | MIC                                | MONITOR          |
|            |           | R.R 61        | O                       | H     | O / H | H   | -     | MIC                                | MONITOR          |
|            |           | R.R 62        | L                       | H     | O / H | H   | -     | MIC                                | MONITOR          |
|            | REC       | *W.O Vno, R.R | L / O                   | H     | O / H | H   | MIC   | -                                  | REC              |
|            |           | Vno 7         | L / O                   | H     | O / H | H   | -     | MIC                                | REC              |
|            |           | R.R 7         | L / O                   | H     | O / H | H   | -     | MIC                                | REC              |

\* W. O = WITHOUT

L : GND  
O : OPEN  
H : V<sub>CC</sub>