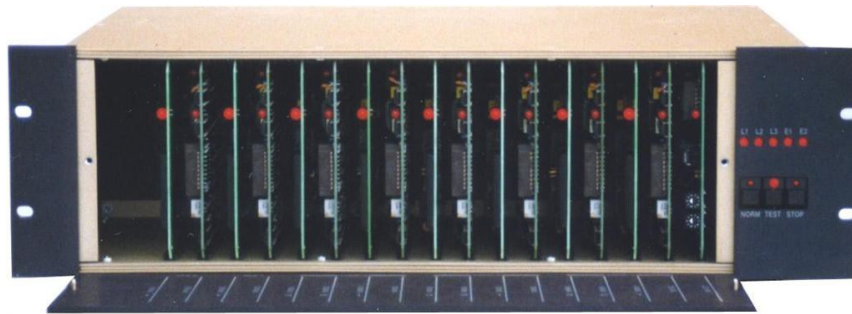


Nuoptix Solid State Digital Audio Products (Old Products)

Product Features
Product Specifications
Technical Information
Application Notes



Type 1 Playback Unit



Type 2 Playback Unit

J R Sky, LLC
tel: +1.406-582-8154
www.jrsky.com

revised Feb 6, 2017

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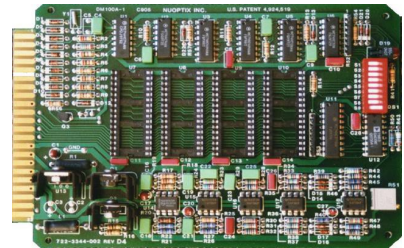
Stand Alone Sound Board (C905) with four 1Mbit EPROM sockets

Part Number:

- C905

Features:

- Play up to 64 seconds
- Single card solution
- Solid State digital audio using Non-Volatile memory
- Four 1Mbit (27C010) EPROM sockets
(sold without EPROMS)
- Simple closure for Start and Stop operation
- On board Volume control
- On board Power amplifier capable of driving an 8Ω load
- On board Play indicator lamp
- On board +5volt regulator for deriving +5volts from the +15volt power input
- Standard 44 card edge connector
- Internal or external sample clock
- Ten year warranty



Specifications:

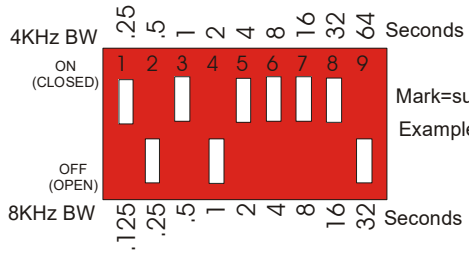
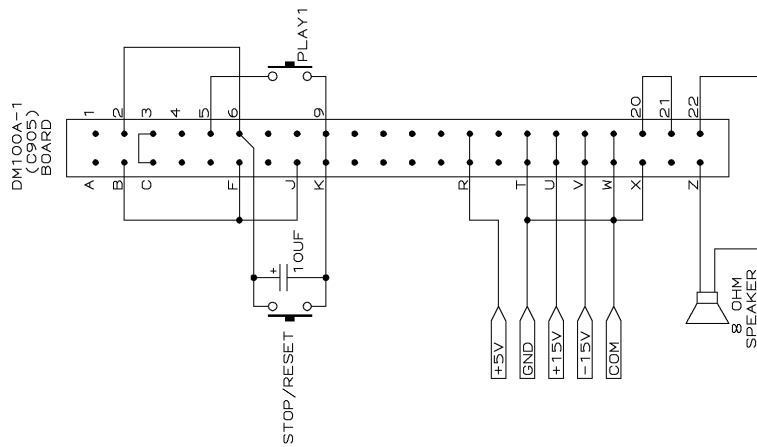
| | |
|-------------|--|
| Playtime: | 64 seconds @ 8,196 sample rate 32 seconds @ 16,384 sample rate |
| Size: | 4½ x 6½" |
| Power Req: | +5VDC @ 100mA and ±15VDC @ 100mA (no load) +5VDC @ 100mA and ±15VDC @ 2amps (8Ω load) |
| THD(1KHz): | <0.6% |
| Bandwidth: | 4 or 8KHz |
| S/N ratio: | 87db (C weighted) |
| Output: | unbalanced 24V _{p-p} =100% into 8Ω |
| Resolution: | 8 Bits companded |

Stand Alone Sound Board with four 1Mbit sockets DM100A-1 (C905)

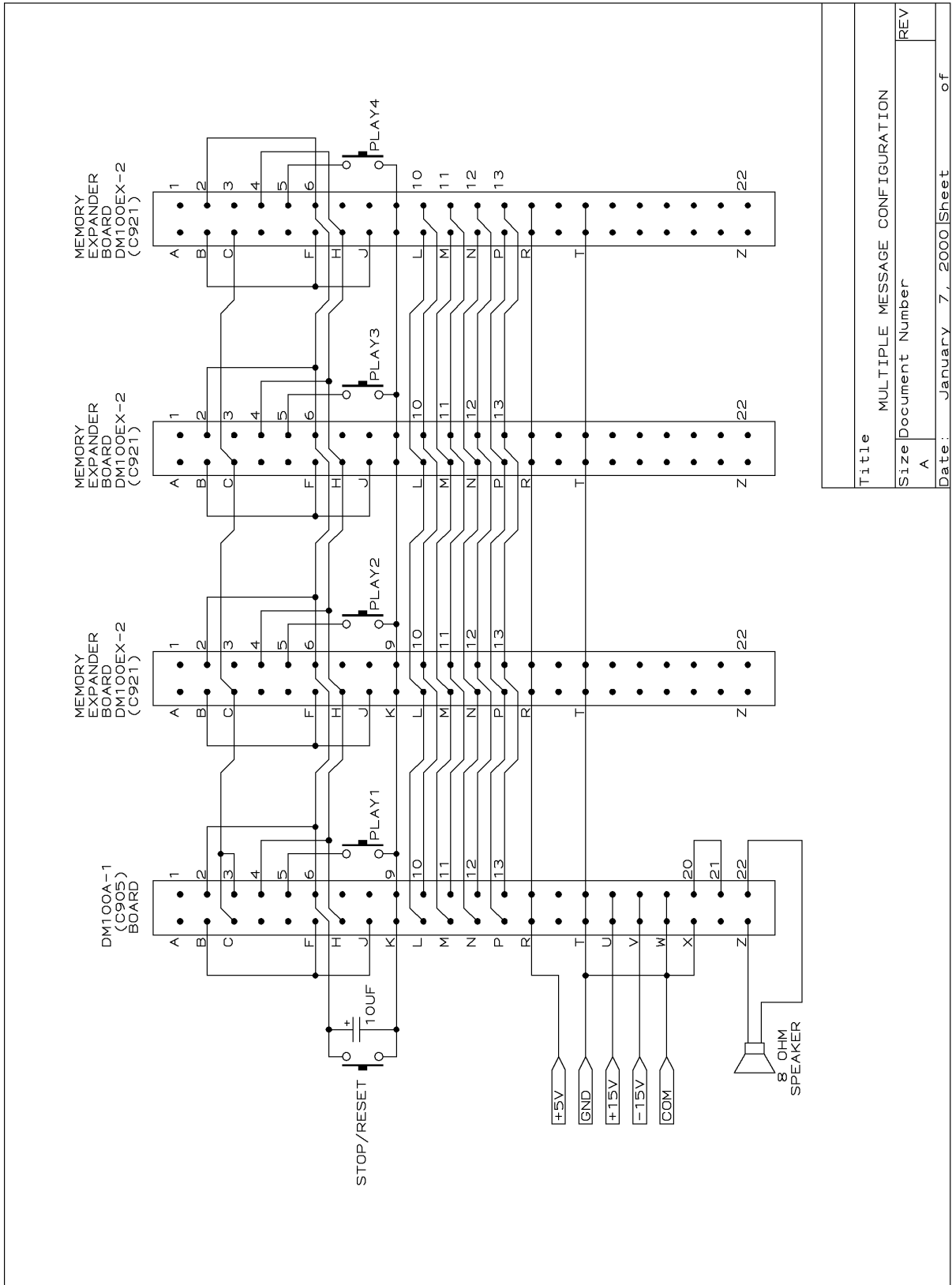
| Name | Pin# | Name |
|----------|------------|---------------|
| Pause | A1 | Fast Access |
| Reset 2 | B2 | Reset 1 |
| Clock In | C3 | Clock Out |
| N/C | D4 | Start Inhibit |
| Start 2 | E5 | Start 1 |
| Stop 2 | F6 | Stop 1 |
| Run | H7 | Stop Inhibit |
| Mark | J8 | N/C |
| Gnd | K9 | Gnd |
| D7 | L10 | D6 |
| D0 | M11 | D5 |

| Name | Pin# | Name |
|--------------|------------|--------------|
| D1 | N12 | D4 |
| D2 | P13 | D3 |
| +5V In | R14 | +5V In |
| +5 Out | S15 | N/C |
| Gnd | T16 | Gnd |
| +15V | U17 | +15V |
| -15V | V18 | -15V |
| Com | W19 | Com |
| Pwr Amp In 2 | X20 | Pwr Amp In 1 |
| Line Out | Y21 | Trim Out |
| Pwr Amp Out | Z22 | Pwr Amp Ret |

| Name | I/O | Active | Description |
|---------------|-----|--------|--|
| Reset 1&2 | I | Low | Low on this pin resets the address counter. |
| Pause | I | | Low on this pin pauses the on-board sample clock. |
| Clock In | I | | 2x Sample Clock. Address counter advances on rising edge. |
| Clock Out | O | | On Board 32,769Hz x2 sample clock. Normally connects to Clock In and other memory expander board(s) if used. |
| Stop 1&2 | I | Low | Low on this pin stops the audio and D0-D7 goes tri-state. |
| Start 1&2 | I | Low | Low on this pin starts the audio and D0-D7 goes active. |
| Run | O | High | High while card is running. Open collector, sources 100ma. |
| Mark | O | Low | Goes low 50uS when mark is reached. Mark is selected via dip switches. Used to stop this board and start next memory expander board in a series. |
| D0-D7 | I | | Audio data output. Connects to memory expander board(s) if used. |
| Start Inhibit | I | High | High on this pin inhibits the start input. |
| Stop Inhibit | I | High | High on this pin inhibits the stop input. |
| +5V In | I | | Power input. +5volts @ 40mA |
| +5V Out | O | | +5V output from on-board regulator which uses the +15V In. Connect to +5V In if an external +5V source is unavailable. |
| +15V In | I | | Analog power input. +15volts @ 50mA |
| -15V In | I | | Analog power input. -15volts @ 50mA |
| Gnd | I | | Ground |
| N/C | | | Unused pin. Leave unconnected. |
| Pwr Amp In 2 | I | | Pwr Amp Input 2. 20KΩ. Normally connect to Com. |
| Line Out | O | | Audio output for line level applications. <50Ω. High side of trimpot. |
| Pwr Amp In 1 | I | | Pwr Amp Input 1. 20KΩ. Normally connects to Trim Out (pin 21). |
| Trim Out | O | | Trimpot wiper. <2500Ω. Normally connects to Pwr Amp In 1 (pin 20). |
| Pwr Amp Out | O | | Power amplifier out. Connects to 8Ω speaker+. |
| Pwr Amp Ret | O | | Power amplifier return. Connects to 8Ω speaker-. |
| Fast Access | I | High | Rising edge advances the address counter by 2048. Used only in micro-controller applications. |



| | |
|-------|-------------------------------------|
| Title | SINGLE MESSAGE USING DM100A-1 BOARD |
| Size | Document Number |
| A | REV |
| Date: | January 6, 2000 |
| Sheet | 6 of |



| | | |
|-------|-----------------|--------------------------------|
| Title | | MULTIPLE MESSAGE CONFIGURATION |
| Size | Document Number | REV |
| A | | |
| Date: | January 7, 2000 | Sheet of |

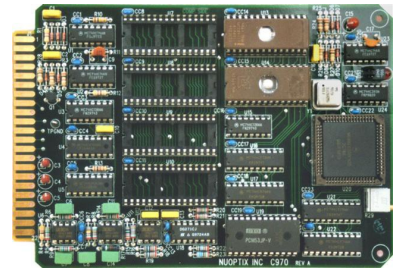
Stand Alone HQ Sound Board (C970) with four 4Mbit EPROM sockets

Part Number:

- C970

Features:

- Ultra High Fidelity, professional quality
- Play up to 58 seconds
- Single card solution
- Solid State digital audio, using Non-volatile memory
- Four 4Mbit EPROM sockets
(sold without EPROMS)
- Low power consumption, <2watts
- Ultra high reliability in all environments
- Simple closure for Start and Stop operation
- On board Volume control
- On board Play indicator lamp
- Standard 44 card edge connector
- Internal or external sample clock
- Automatically stops at end of message
- Ten year warranty



Specifications:

| | |
|-------------|--|
| Playtime: | 58 seconds @ 36,015 sample rate |
| Size: | 4½ x 6½" |
| Power Req: | +5VDC @ 130mA and ±15VDC @ 50mA (total pwr <2watts) |
| THD(1KHz): | <0.001% |
| Bandwidth: | 16KHz or 20KHz |
| S/N ratio: | 96db (C weighted) |
| Output: | unbalanced line level (5V _{p-p} =100%), <500Ω |
| Resolution: | 16 Bits |

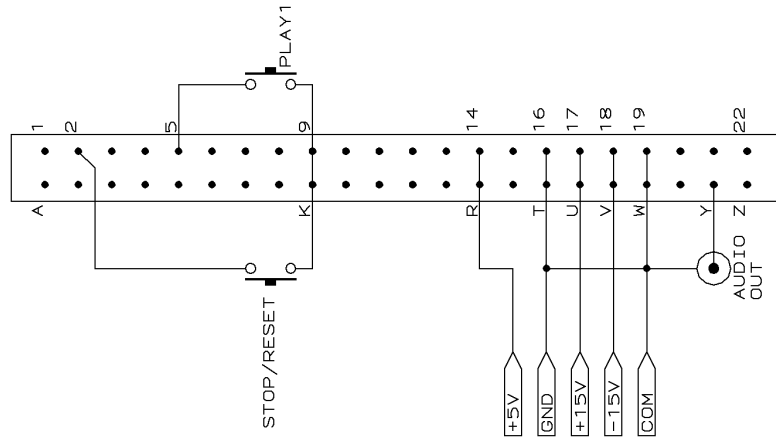
Stand Alone HQ Sound Board with four 4Mbit EPROMS sockets (C970)

| Name | Pin# | Name |
|-----------|------------|-----------|
| N/C | A1 | Pause |
| Reset 2 | B2 | Reset 1 |
| Clock | C3 | N/C |
| Sample | D4 | Start Inh |
| Start 2 | E5 | Start |
| Stop 2 | F6 | N/C |
| Run | H7 | N/C |
| Reset Out | J8 | N/C |
| Gnd | K9 | Gnd |
| D7 | L10 | D6 |
| D0 | M11 | D5 |

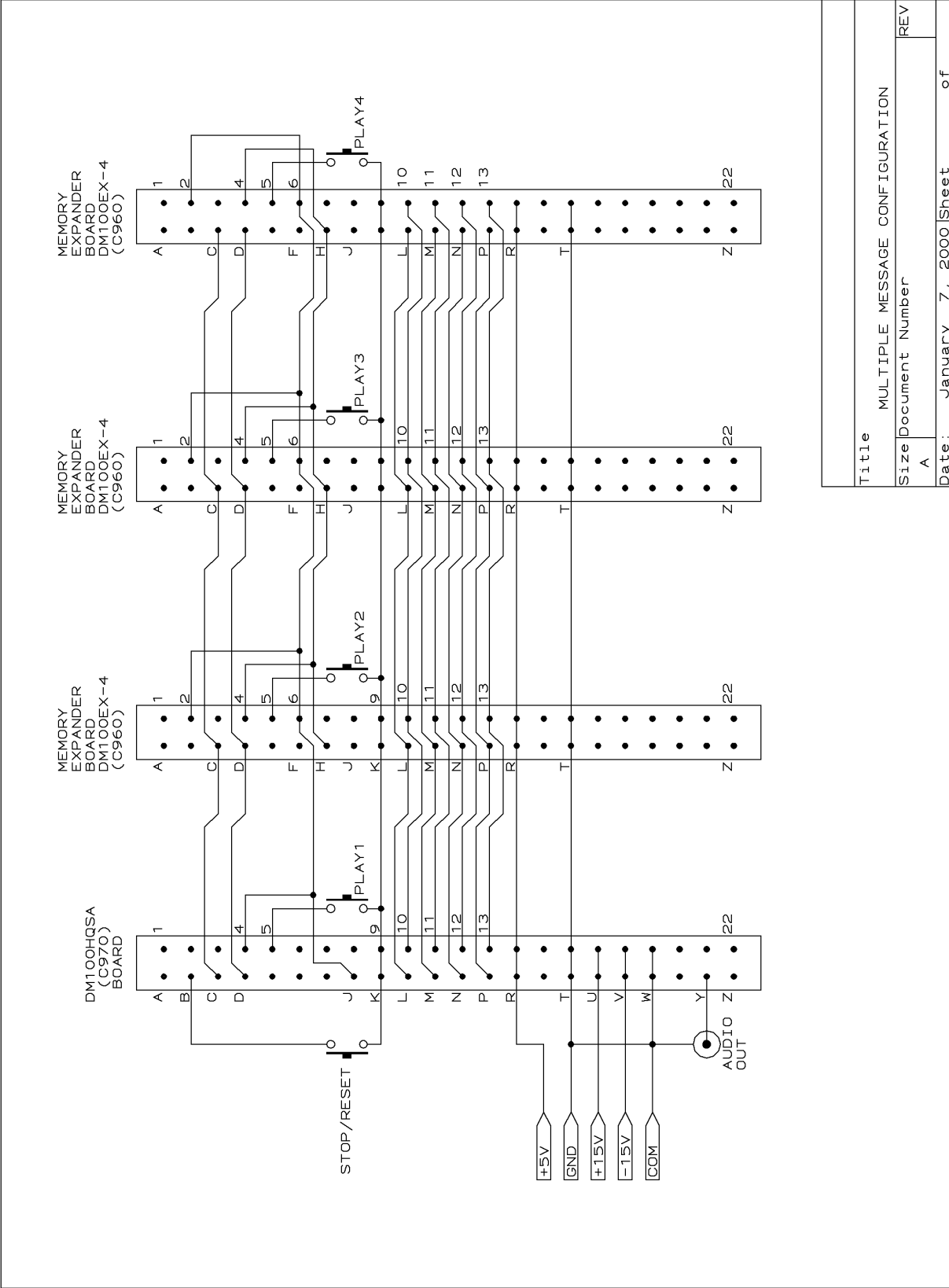
| Name | Pin# | Name |
|-------|------------|------|
| D1 | N12 | D4 |
| D2 | P13 | D3 |
| +5V | R14 | +5V |
| N/C | S15 | N/C |
| Gnd | T16 | Gnd |
| +15V | U17 | +15V |
| -15V | V18 | -15V |
| Com | W19 | Com |
| N/C | X20 | N/C |
| Audio | Y21 | N/C |
| N/C | Z22 | N/C |

| Name | I/O | Active | Description |
|-----------|-----|--------|--|
| Reset 1&2 | I | Low | Low on this pin resets the address counter and stops the audio. D0-D7 goes tri-state. |
| Clock | I/O | | 2x Sample Clock. Address counter advances on rising edge. With W1 shunt install, internal sample x2 clock can drive external memory expander board(s) if used. |
| Sample | I | High | 1x Sample Clock while card is running. Connects to memory expander board(s) if used. |
| Start | I | Low | Low on this pin starts the audio playing. D0-D7 goes active. |
| Start Inh | I | High | High on this pin inhibits the start input. |
| Run | O | High | High while card is running. Open collector, sources 100ma. |
| Reset Out | O | Low | Goes low 50uS after last sample or on falling edge of Reset In. Used to stop/reset external memory expander board(s) if used. |
| D0-D7 | I | | Audio data input. Connects to memory expander board(s) if used. |
| +15V | I | | Analog power input. +15volts @ 50mA |
| -15V | I | | Analog power input. -15volts @ 50mA |
| +5V | I | | Digital power input. +5volts @ 130mA |
| Com | I | | Analog common |
| Gnd | I | | Digital ground |
| N/C | | | Unused pin. Leave unconnected. |
| Pause | I | Low | Low on this pin pauses audio until released. |

DM1100HQSA
(G970)
BOARD



| | |
|---|-----------------|
| Title | |
| SINGLE MESSAGE USING STAND ALONE HQ BOARD | |
| Size | Document Number |
| A | REV |
| Date: | January 7, 2000 |
| Sheet | of |



| | | | |
|-------|-----------------|--------------------------------|----|
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| Size | Document Number | REV | |
| A | | | |
| Date: | January 7, 2000 | Sheet | of |

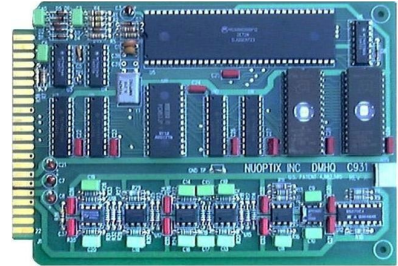
HQ Sound Board (C931)

Part Number:

- C931

Features:

- Ultra High Fidelity, professional quality
- Solid State digital audio
- Low power consumption, <2watts
- On board Volume control
- On board Play indicator lamp
- Standard 44 card edge connector
- Internal or external sample clock
- Ten year warranty



Specifications:

| | |
|-------------|--|
| Size: | 4½ x 6½" |
| Power Req: | +5VDC @ 130mA and ±15VDC @ 50mA (total pwr <2watts) |
| THD(1KHz): | <0.001% |
| Bandwidth: | 16KHz or 20KHz |
| S/N ratio: | 96db (C weighted) |
| Output: | unbalanced line level (5V _{p-p} =100%), <500Ω |
| Resolution: | 16 Bits |

HQ Sound Board DM100HQSA (C931)

| Name | Pin# | Name |
|-----------|------------|---------|
| N/C | A1 | Pause |
| Reset 2 | B2 | Reset 1 |
| Clock | C3 | N/C |
| Sample | D4 | N/C |
| N/C | E5 | Start |
| N/C | F6 | N/C |
| N/C | H7 | N/C |
| Reset Out | J8 | N/C |
| Gnd | K9 | Gnd |
| D7 | L10 | D6 |
| D0 | M11 | D5 |

| Name | Pin# | Name |
|-------|------------|------|
| D1 | N12 | D4 |
| D2 | P13 | D3 |
| +5V | R14 | +5V |
| N/C | S15 | N/C |
| Gnd | T16 | Gnd |
| +15V | U17 | +15V |
| -15V | V18 | -15V |
| Com | W19 | Com |
| N/C | X20 | N/C |
| Audio | Y21 | N/C |
| N/C | Z22 | N/C |

| Name | I/O | Active | Description |
|-----------|-----|--------|--|
| Reset 1&2 | I | Low | Low on this pin reset processor and sends a reset out on pin J. |
| Clock | O | | 2x Sample Clock. Used to drive external memory expander board(s). |
| Sample | I | High | 1x Sample Clock while card is running. Connects to memory expander board(s). |
| Reset Out | O | Low | Goes low 50uS on falling edge of Reset In. Used to reset external expander board(s). |
| D0-D7 | I | | Audio data input. Connects to memory expander board(s). |
| +15V | I | | Analog power input. +15volts @ 50mA |
| -15V | I | | Analog power input. -15volts @ 50mA |
| +5V | I | | Digital power input. +5volts @ 130mA |
| Com | I | | Analog common |
| Gnd | I | | Digital ground |
| N/C | | | Unused pin. Leave unconnected. |
| Pause | I | Low | Low on this pin pauses audio until released. |

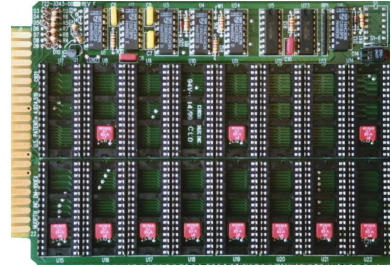
4.19Mbyte Memory Expander Board (C921)

Part Number:

- C921

Features:

- 4.19 Mbytes of memory
- Holds sixteen 2Mbit EPROMS (27C020)
(sold without EPROMS)
- Low power consumption, <0.2watts
- Continuous operation
- Simple closure for Start, Stop and Reset
- Uses Standard 44 card edge connector
- Ten year warranty



Specifications:

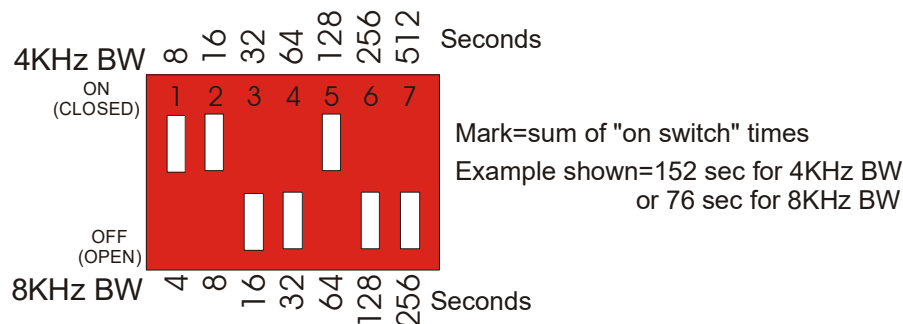
| | |
|------------|---|
| Playtime: | 8.53 minutes @ 8,192 sample rate (4KHz BW) |
| | 4.26 minutes @ 16,384 sample rate (8KHz BW) |
| Size: | 4½ x 6½" |
| Power Req: | +5VDC @ 40mA |

4.19Mbyte Memory Expander Board (C921)

| Name | Pin# | Name |
|---------|-------------|---------------|
| N/C | A 1 | Fast Access |
| Reset 2 | B 2 | Reset 1 |
| Clock | C 3 | N/C |
| Sample | D 4 | Start Inhibit |
| Start 2 | E 5 | Start 1 |
| Stop 2 | F 6 | Stop 1 |
| Run | H 7 | Stop Inhibit |
| Mark | J 8 | N/C |
| Gnd | K 9 | Gnd |
| D7 | L 10 | D6 |
| D0 | M 11 | D5 |

| Name | Pin# | Name |
|------|-------------|------|
| D1 | N 12 | D4 |
| D2 | P 13 | D3 |
| +5V | R 14 | +5V |
| N/C | S 15 | N/C |
| Gnd | T 16 | Gnd |
| N/C | U 17 | N/C |
| N/C | V 18 | N/C |
| N/C | W 19 | N/C |
| N/C | X 20 | N/C |
| N/C | Y 21 | N/C |
| N/C | Z 22 | N/C |

| Name | I/O | Active | Description |
|---------------|-----|--------|--|
| Reset 1&2 | I | Low | Low on this pin resets the address counter. |
| Clock | I | | 2x Sample Clock. Address counter advances on rising edge. |
| Sample | O | High | 1x Sample Clock while card is running. Open collector, sources 7ma. |
| Stop 1&2 | I | Low | Low on this pin stops the address counter and D0-D7 goes tri-start. |
| Start 1&2 | I | Low | Low on this pin starts the address counter and D0-D7 goes active. |
| Run | O | High | High while card is running. Open collector, sources 100ma. Can be used for external run LED. |
| Mark | O | Low | Goes low 50uS when mark is reached. Mark is selected via dip switches. Used to stop this board and start next memory expander board in a series. |
| D0-D7 | O | | Audio data output. Connects to master output board. |
| Start Inhibit | I | High | High on this pin inhibits the start input |
| Stop Inhibit | I | High | High on this pin inhibits the stop input |
| +5V | I | | Power input. +5volts @ 40mA |
| Gnd | I | | Ground |
| N/C | | | Unused pin. Leave unconnected. |
| Fast Access | I | High | Rising edge advances the address counter by 2048 |



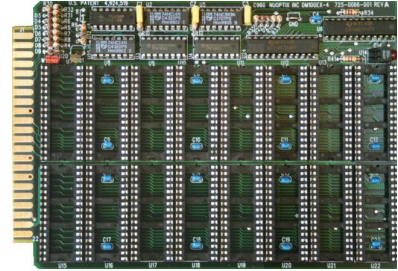
8.38Mbyte Memory Expander Board (C960)

Part Number:

- C960

Features:

- 8.38 Mbytes of memory
- Holds sixteen 4 Mbit EPROMS (27C040)
(sold without EPROMS)
- Low power consumption, <0.2watts
- Continuous operation
- Simple closure for Start, Stop and Reset
- Uses Standard 44 card edge connector
- Ten year warranty



Specifications:

| | |
|------------|---|
| Playtime: | 3.88 minutes @ 36,015 sample rate 3.17 minutes @ 44,100 sample rate 2.91 minutes @ 48,000 sample rate |
| Size: | 4½ x 6½" |
| Power Req: | +5VDC @ 40mA |

8.38Mbyte Memory Expander Board (C960)

| Name | Pin# | Name |
|---------|-------------|---------------|
| N/C | A 1 | Fast Access |
| Reset 2 | B 2 | Reset 1 |
| Clock | C 3 | N/C |
| Sample | D 4 | Start Inhibit |
| Start 2 | E 5 | Start 1 |
| Stop 2 | F 6 | Stop 1 |
| Run | H 7 | Stop Inhibit |
| Mark | J 8 | N/C |
| Gnd | K 9 | Gnd |
| D7 | L 10 | D6 |
| D0 | M 11 | D5 |

| Name | Pin# | Name |
|------|-------------|------|
| D1 | N 12 | D4 |
| D2 | P 13 | D3 |
| +5V | R 14 | +5V |
| N/C | S 15 | N/C |
| Gnd | T 16 | Gnd |
| N/C | U 17 | N/C |
| N/C | V 18 | N/C |
| N/C | W 19 | N/C |
| CE | X 20 | OE |
| N/C | Y 21 | Vpp |
| N/C | Z 22 | N/C |

| Name | I/O | Active | Description |
|---------------|-----|--------|---|
| Reset 1&2 | I | Low | Low on this pin resets the address counter. |
| Clock | I | | 2x Sample Clock. Address counter advances on rising edge. |
| Sample | O | High | 1x Sample Clock while card is running. Open collector, sources 7ma. |
| Stop 1&2 | I | Low | Low on this pin stops the address counter and D0-D7 goes tri-start. |
| Start 1&2 | I | Low | Low on this pin starts the address counter and D0-D7 goes active. |
| Run | O | High | High while card is running. Open collector, sources 100ma. Can be used for external run LED. |
| Mark | O | Low | Goes low 50uS after last address on board is reached. Used to stop is board and start next memory expander board in a series. |
| D0-D7 | O | | Audio data output. Connects to master output board. |
| Start Inhibit | I | High | High on this pin inhibits the start input |
| Stop Inhibit | I | High | High on this pin inhibits the stop input |
| +5V | I | | Power input. +5volts @ 40mA |
| Gnd | I | | Ground |
| N/C | | | Unused pin. Leave unconnected. |
| CE | I | Low | Chip enable. Leave unconnected |
| OE | I | Low | Output enable. Leave unconnected. |
| Vpp | I | | +12.5V input for programming. Leave unconnected. |
| Fast Access | I | High | Rising edge advances the address counter by 2048 |

W1 must have a shunt jumper.

Controller Board (C928)

| Name | Pin# | Name |
|----------|-------------|-------------|
| Pause | A 1 | Fast Access |
| Aux Read | B 2 | Reset |
| Clock | C 3 | Emergency |
| Aux Sel | D 4 | Host D7 |
| Host D1 | E 5 | Host D0 |
| Host D6 | F 6 | Stop |
| Host D3 | H 7 | Host D2 |
| Host D4 | J 8 | Host D5 |
| Gnd | K 9 | DTMF |
| Audio D7 | L 10 | Audio D6 |
| Audio D0 | M 11 | Audio D5 |

| Name | Pin# | Name |
|----------|-------------|----------|
| Audio D1 | N 12 | Audio D4 |
| Audio D2 | P 13 | Audio D3 |
| Aux Int | R 14 | +5V |
| Start 2 | S 15 | Start 1 |
| Start 4 | T 16 | Start 3 |
| Start 6 | U 17 | Start 5 |
| Start 8 | V 18 | Start 7 |
| Start 10 | W 19 | Start 9 |
| Start 12 | X 20 | Start 11 |
| Start 14 | Y 21 | Start 13 |
| Start 16 | Z 22 | Start 15 |

| Name | I/O | Active | Description |
|-------------|-----|--------|--|
| Pause | O | Low | Low on this pin pauses audio. |
| Aux Read | O | High | This is a general purpose output (1uS pulse only). |
| Aux Sel | I | Low | This is a general purpose input. |
| Aux Int | I | High | This input use to interrupt the microprocessor. |
| DTMF | I | | This is the analog DTMF input. 2Vp-p max level. |
| Emergency | I | Low | Low on this pin plays an emergency message. |
| Reset | O | Low | This output resets external memory expander boards. |
| Stop | O | Low | This output stops external memory expander boards. |
| Clock | I/O | | 2x Sample Clock. |
| Host D0-D7 | I/O | | This is a general purpose 8bit I/O ports. |
| Audio D0-D7 | I | | This is the audio input used to check for end mark. |
| Start 1-16 | O | Low | This output used to start external memory expander cards. |
| +5V | I | | Power input. +5volts @ 40mA |
| Gnd | I | | Ground |
| Fast Access | O | High | This output used to advance external memory board addresses. |

Type 1 & 2 Playback Units, General Overview

Nuoptix manufactures two varieties of 19" rack mount digital audio packages. One is a single channel, 1¾" tall (single rack space) system and the other is a five channel, 5¼" tall (three rack space) system. All electronics are contained on 4½" x 6" plug in cards to facilitate programming and repair.

The single channel version provides up to 15.4 minutes of sound using C960 expander boards. The unit can be operated in a single closure to start mode or in a more versatile DTMF control mode. In the DTMF mode all operations including synchronous operation in multi-channel applications can be controlled over a single audio quality input which can be broadcast or provided by direct wire connection. Multiple units can be controlled by a single DTMF signal. The DTMF control function operates through a microprocessor controller in the system. This allows essentially any control function desired. The 5¼", five channel, system contains three channels like that of the single channel system all controlled by a single DTMF microprocessor controller and two independent channels capable of being started by a single closure.

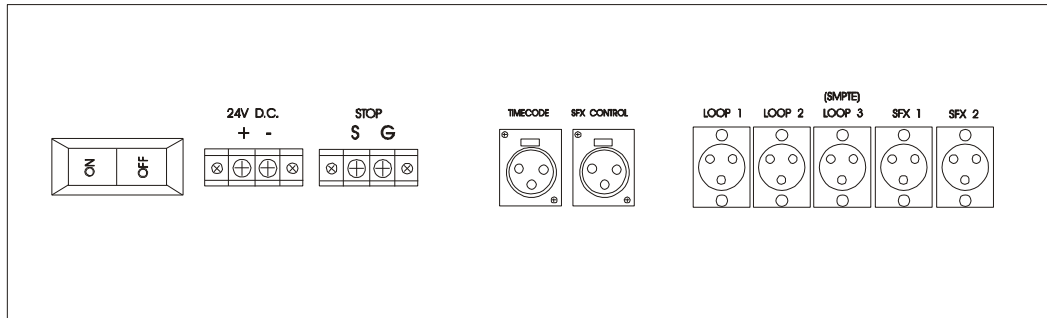
These systems were designed for remote multi-channel synchronous operation such as parades with FM broadcast of the DTMF control (synchronizing) signal. They are also applicable to any remote or multiple channel solid state digital audio application.

There are two types of Nuoptix playback rack mountable chassis available. Both use the Nuoptix C931 Digital audio solid state playback system for true 16 bit digital hi-fi reproduction. Both units operate on an 18-36 VDC input and have a power switch located on the back of the unit.

TYPE 1 CASE: This unit comes in a 5¼" rack mount case and has five output channels, three of which are timecode controlled outputs and the other two are single play outputs activated by a closure. This case provides up to 11.4 minutes per channel of audio storage, using C960 expander cards, for the timecode controlled outputs and 1.9 minutes per channel of audio storage using, C921 expander cards, for the single play outputs.

TYPE 2 CASE: This unit has one output and comes in a 1¾" rack mount case. This unit can be operated in either a timecode control mode or a closure mode. Both systems allow a wide range of control options. The type 2 case provides up to 15.4 seconds of single channel audio storage using the C921 expander cards.

The Type 1 Playback Unit



Rear Panel View

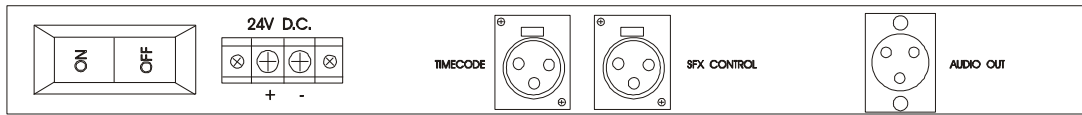
This unit comes in a 5¼" rack mount case and has five output channels, three of which are timecode controlled channels, labeled loop 1, loop 2 and loop 3 (SMPTE). The other two channels, labeled SFX 1 and SFX 2, are single play channels activated by a closure. This case provides up to 11.4 minutes per channel of audio storage for the Loop channels (using C960 expander cards) and 1.9 minutes per channel of audio storage for the SFX channels (using C921 expander cards). The SFX channels can only use C921 expander cards because dip switches on the card are used to set the stop mark rather than using a Loopmark on the EPROM file itself. C960 expander cards do not have these dip switches.

If the Loop channels are being used, Loop channel 1 must be installed for proper operation. Loop channel 1 must also have the file Loopmark on its EPROM file for normal loop operation. The micro-controller uses the Loopmark of channel 1 for looping all three channels. The file Loopmark is only required on channel 1 and not required on the other two channels.

All channels being used require a C931 output card for operation. A C928 timecode reader card is also required for timecode controlled applications. All memory expander cards should have audio EPROMs installed on them. No blank memory cards should be installed.

The timecode reader controller card checks for audio errors on the three Loop channels while playing. If any errors are detected, the controller will reset itself and relocate accordingly. This is another built in safety feature of the system.

The Type 2 Playback Unit



Rear Panel View

This unit has one output and comes in a 1 $\frac{3}{4}$ " rack mount case. This unit can be operated in either a timecode control mode or a closure mode (non-timecode operation). The type 2 case provides up to 15.4 minutes of single channel audio storage.

This unit requires a C931 output card for operation. A C928 timecode reader card is also required for time code controlled applications. The TIMECODE input connector on the rear panel is used in this situation for timecode input. For non-timecode controlled applications, a C928 controller card is required. The SFX input connector on the rear panel is used in this situation.

The timecode reader card checks for audio errors while playing. If any errors are detected, the controller will reset itself and relocate accordingly. This is another built in safety feature of the system.

Front Panel Switches for the Type 1 & 2 units

The illuminated LED on the switch indicates the current state. When powered on the unit will default to Normal.

Normal Button: When pressed, the Loop channels are ready to receive timecode and respond accordingly. The two effects channels will start playing upon receiving a closure to ground on the SFX CONTROL input XLR connector on the back panel. Whenever the NORM button is pressed the SFX channels will stop playing (if it was playing) and reset.

Test Button: When pressed, the three Loop channels will start playing from the beginning and will continue to loop. The SFX channels will play once then stop, however after the SFX channel has stopped playing, it can be restarted by pressing the TEST button again.

Stop Button: When pressed, the Loop channels will not play. The SFX channels will stop playing (if they were playing), every time the STOP switch is pressed, however, they can be restarted from an input closure.

Modes of Operation for the Type 1 & 2 units

The unit can operate in two different modes, for sync to timecode applications and for non-sync applications. The behavior of the front panel switches depends on the mode of operation. The illuminated LED on the switch indicates the current state. When powered on the unit will default to Normal.

1) SYNC TO TIMECODE MODE:

Normal Button: When pressed, the channel is ready to receive timecode and respond accordingly.

Test Button: When pressed, the channel will start playing from the beginning and will continue to loop.

Stop Button: When pressed, the channel will not play.

2) NON SYNC OPERATION:

Normal Button: When pressed, the channel will play the first message upon receiving a closure on the SFX Control input. Every closure thereafter will play the next consecutive message. When the last message is played the controller will start over and the next message played will be message 1. If there is only one message then only that one message will play.

Test Button: When pressed, the channel will play all the messages in order, continuously, then loop.

Stop Button: When pressed, the channel will not play.

Input and Output Connectors for Type 1 & 2 units

POWER INPUT: Both Type 1&2 units operate from 18-36 VDC (24 VDC Nominal) @ 3 amps MAX. The input connector is located on the back panel. The Power switch is also a circuit breaker.

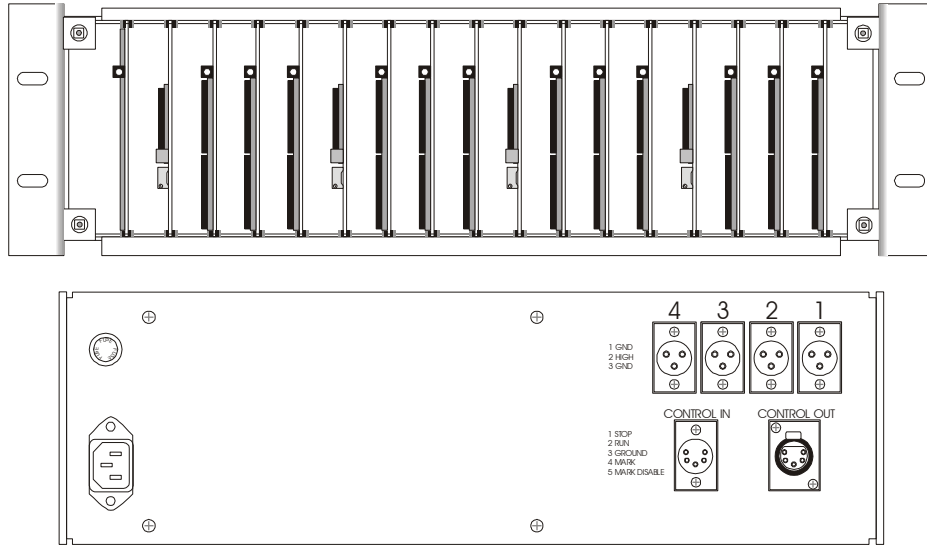
AUDIO OUTPUTS: All audio outputs are unbalanced with a 600 Ω impedance. Male 3 Pin XLR connectors are used with pin 2 high and pin 3 ground.

STOP: Closure from terminal 'S' (stop) to 'G' (ground) is the same as pressing the stop button on the front panel. There is 1K Ω pull resistor up to +5V internally.

TIMECODE INPUT: Timecode input uses a 3 pin female XLR connector with pin 2 high and pin 3 ground. Input is unbalanced with a 20K Ω impedance. The DTMF receiver accepts a wide range of input levels from 1.7 V_{p-p} to 0.1 V_{p-p} (1V_{p-p} nominal). The DTMF signals must not be clipped or compressed.

SFX CONTROL INPUT: This input uses a 3 pin female XLR connector with pin 1 used for SFX channel 1 and pin 2 used for SFX channel 2 (type 1 case only) and pin 3 ground. Input(s) require a CLOSURE to ground for operation. Input(s) have a 220 Ω pull up resistor to +5 volts.

The CCF Facade Playback Unit



General

The facade playback unit is a four channel rack mountable playback unit. Each channel can play up to 696 seconds. This unit is intended to provide the DTMF audio for the FM transmitter, SMPTE timecode, and audio for the facade channels. It will be run in a loop mode only. Channel 1, which will be the DTMF track, will have an END marker on the track that will cause the unit to loop. This Loopmarker will cause the other three channels to loop also. Multiple facade units can be connected together to provide as many channels of audio as necessary. The first unit would be channels 1-4, the second unit would be channels 4-8, and so on. Channel 1 will provide the END marker for all the units to loop on. The DTMF track is the only track with the END marker. All other channels will follow channel 1.

The Front Panel

As viewed from the front of the unit the leftmost card is slot 1 and the rightmost is slot 17. The printed circuit cards insert with the components facing to the left. The printed circuit assignment is as follows:

| | | | |
|--------|-------------------------|---------|-------------------------|
| SLOT 1 | End Detector Board | | |
| | | | |
| SLOT 2 | DM100HQ/D (Output) | SLOT 10 | DM100HQ/D (Output) |
| SLOT 3 | Expander Board (Memory) | SLOT 11 | Expander Board (Memory) |
| SLOT 4 | Expander Board (Memory) | SLOT 12 | Expander Board (Memory) |
| SLOT 5 | Expander Board (Memory) | SLOT 13 | Expander Board (Memory) |
| | | | |
| SLOT 6 | DM100HQ/D (Output) | SLOT 14 | DM100HQ/D (Output) |
| SLOT 7 | Expander Board (Memory) | SLOT 15 | Expander Board (Memory) |
| SLOT 8 | Expander Board (Memory) | SLOT 16 | Expander Board (Memory) |
| SLOT 9 | Expander Board (Memory) | SLOT 17 | Expander Board (Memory) |

END DETECTOR: This card is a modified DM100AX-1 EPROM memory card. It can be identified by white wires added to the circuit side of the printed circuit board. Although there are sockets for eight EPROM's, no EPROM's are intended to populate this card. The function of this card is to detect the END MARKERS in the DTMF EPROM file. This special card will reside in slot 1 of the master card cage, that is the card cage that has DTMF track for channel 1. All other slave units must NOT have the END DETECTOR card inserted into the card cage. Therefore only one END DETECTOR card is required for the entire facade system.

DM100HQ/D: This card is the audio output card that has the digital data decoder and digital to analog converter. The output card has a level adjust pot accessible from the front and is capable of driving 600Ω load unbalanced.

EXPANDER: This card is EPROM memory card. Any one of three types can be used; the DM100EX-1 capable of holding sixteen 1 megabit EPROM's (58 seconds max. per card), the DM100EX-2 capable of holding sixteen 2 megabit EPROM's (116 seconds max. per card), and the DM100EX-4 capable of holding sixteen 4 megabit EPROM's (232 seconds max. per card). Each card has a red LED on the front which indicates which card is currently playing. When the unit is not running the EXPANDER memory cards are reset to the beginning and the advancing clock is disabled. The first EXPANDER card in each group will have its red LED illuminated indicating that it is on and ready for the clock to advance.

The Rear Panel

AUDIO OUT: The rear panel has four audio, 3 pin male XLR connectors. Channels are indicated 1-4. Pin 2 is high and pins 1&3 are ground. Once again, the output are capable of driving 600Ω load unbalanced.

CONTROL CONNECTORS: There are two 5 pin XLR connectors on the rear. The female connector is for control in and the male is control out. The two connectors are wired internally 1:1. The following is the pinout assignments for both connectors:

PIN 1 STOP
PIN 2 RUN
PIN 3 GROUND
PIN 4 MARK
PIN 5 MARK INHIBIT

The show controller signals should connect to the control input of the master unit (i.e. the card cage which the DTMF track). Control signals from the show controller should have either TTL output, 5volt CMOS outputs, open collector outputs or open drain outputs with 10ma capability. The TTL and CMOS outputs must be active low. Use of open collector or open drain output are recommended. The connections should be made as follows:

STOP (PIN 1): A momentary active signal (>1ms) on pin 1 will stop the unit.

RUN (PIN 2): A momentary active signal (>1ms) on pin 2 will start the unit playing.

GROUND (PIN 3): The ground wire of the show controller must be connected the ground wire of the facade unit.

MARK (PIN 4): Pin 4 is the output of the END DETECTOR and should be left open.

MARK INHIBIT (PIN 5): When the signal from the show controller is active the END DETECTOR will be disabled. This should be made active during the transition from the "pre-roll" to the "main production".

To connect additional slave units to the master unit, use a short 1:1 cable from the control out of the master unit to the control in of the slave unit. In the same manner, use a short 1:1 cable from the control out of one slave unit to the control in of the next slave unit. Add as many slave units as necessary.

POWER INPUT: The power input can be set for 100VAC, 120VAC, 220VAC or 230VAC/240VAC. Observe the table below for proper connections to the primaries of the power transformer.

| | 100VAC | 120VAC | 220VAC | 230-240VAC |
|-------------|------------|------------|----------|------------|
| JUMPER | 1&3 2&4 | 1&3 2&4 | 2&3 | 2&3 |
| APPLY AC | 1&5 | 1&4 | 1&5 | 1&4 |
| FUSE RATING | 3 AMP | 3 AMPS | 1.5 AMPS | 1.5 AMPS |