

AUDIO PALETTE
OWNER'S MANUAL
Standard/MIV

Serial Number

Table of Contents

Introduction.....	1
Product Concept and Description	2
Unpacking.....	3
Installation.....	3
Connection.....	3
Connection Diagrams.....	4-5
Operation.....	6
Input Impedance.....	6
Controls.....	6
Frequency Response Adjustments	7
Using Calibrated Controls	7
Warranty	8
Service.....	8
Block Wiring Diagram.....	9-10
Input Impedance Settings.....	11
Specifications.....	12

Introduction

Congratulations on choosing the Audio Palette. Your unit has been individually hand-made from the finest parts and materials. The Audio Palette utilizes proprietary Cello circuitry that represents the true state-of-the-art in audio electronics. It is designed to perform to specifications for decades of musical enjoyment.

We want your Audio Palette to provide you with complete satisfaction. This unique instrument requires proper installation in order to perform to its full potential.

This manual is for both standard version (STD) and the multiple input

version (MIV) of the Audio Palette. Information applies to both versions unless specific information is provided for each.

Please read this manual carefully. Because of its flexibility, the Audio Palette can be used to do as much or as little as you want it to do. The instructions in this manual provide basic steps to enable you to enjoy music in a new, participatory way.

If you have any questions, contact your authorized Cello supplier or call the factory. It is our wish to assist you in every way, now and in the future.

Product Concept and Description

The Audio Palette is a distillation of 45 years of research by Richard S. Burwen, expressed in Class A discrete circuitry designed by Thomas P. Colangelo. The Audio Palette and power supply contain over 6,000 parts comprising 48 discrete Class A push-pull amplifiers, nine 59-position Cello rotary controls, and many premium, custom-made components.

The Audio Palette advances musical realism more than any other single component and it is the heart of the Cello Music System.

In the Audio Palette, Cello has developed a tone control system of

unparalleled quality. Tonal balance can be corrected with no sonic deterioration. The Audio Palette allows you to dial in, from the listening position, the most subtle or radical adjustments which restore the vitality and life to recordings of music.

Major record labels use the Audio Palette to restore older recordings and to make the finest compact discs. However, you don't have to be an engineer to use the Audio Palette. The most non-technical listener can obtain excellent results with a small amount of practice.

Instructions

UNPACKING

Inspect the containers for signs of damage in transit. Report any evidence of abuse immediately. Open containers carefully and remove contents from the packing. Take care not to scratch the surfaces of the unit. Save all boxes and foam pieces for reuse in the event that the unit must be shipped in the future. If the boxes should become lost, replacement boxes are available from the factory.

Packing Contents:

- One Audio Palette
- One DC Cable
- One Ground Jumper
- One Torx Key

Accessories to be Ordered and Shipped Separately:

- Cello Strings
- Master Supply-with AC Cable and Ground Jumper

INSTALLATION

Ideally, the Audio Palette should be located at the "listening position" (location in the room where you will usually sit to listen to music). This puts all the important controls at your fingertips. In most cases, the Audio Palette will be connected between the Audio Suite or other preamplifier and the power amplifiers in use. It may also go in the tape loop.

The Audio Palette may be installed in a table, cart, or other housing provided that the rear of the unit is well ventilated. If the front rack holes are to be used as the sole support (without the feet), then reinforcing L-brackets (part number 53-1100-00-09-00) should be used to strengthen the mounting. Contact your authorized Cello supplier for further information.

With the Audio Palette placed at the listening position, the power supply may be

located near your Audio Suite or other components. In most systems, the audio inputs and outputs and the DC cable will be run from the Audio Palette through a single conduit back to the Audio Suite/preamplifier location.

CONNECTION

The Audio Palette uses three-pin Fischer connectors for the highest quality balanced input and output connections. At the input, the standard version has 1 Fischer and 3 RCA connections. The MIV has 2 Fischers and 6 RCA connections. At the output, in addition to the Fischer connectors, there are 3 pair of RCA connectors. One pair of RCA's are for use as a single ended Main output. The other two pairs of RCA's are fixed level record outputs.

It is recommended that you use Cello Strings cables. Cello Strings are stocked in lengths of 1, 2, 5, 8, and 10 meters, and come assembled with a variety of connectors: Fischer, XLR, and RCA. Custom length Cello Strings are available through your authorized Cello supplier.

Adaptors are available for connecting your Audio Palette to RCA and Camac type systems. Please contact your authorized Cello supplier for information and prices.

The Audio Palette may be used with the audio ground separated from the earth ground or connected to it. A jumper on either rear supply barrier strip between WHITE and BLUE connects these points. Whichever yields the lowest hum and noise should be selected. Make these connections with power off. Our test instruments have this optional ground float feature so we decided to introduce it in our products as well, for lowest noise characteristics.

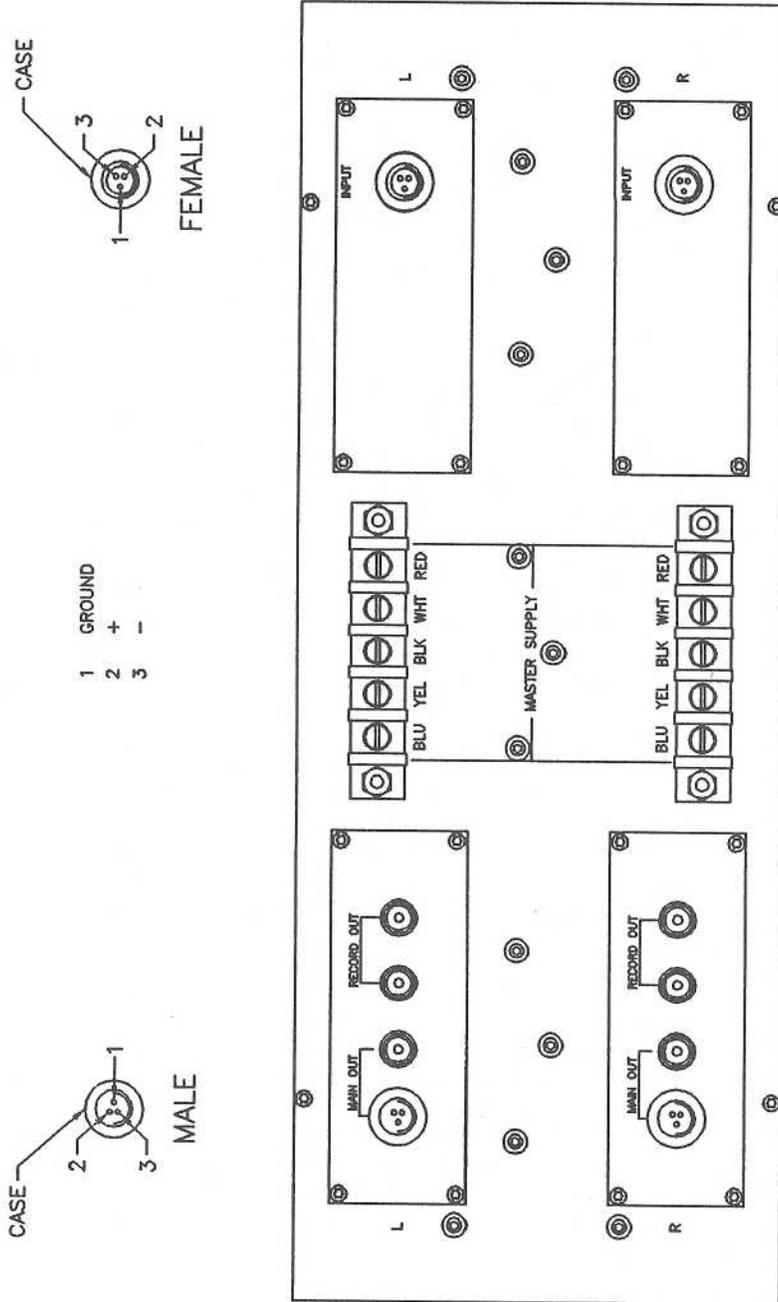
RECOMMENDATIONS

1. Make certain that all on /off switches are "off".
2. Verify that AC Mains voltage setting is correct (see label on rear of Master Supply).
3. Install the DC cable by connecting the colored wires to the corresponding terminals on the back of the unit.
4. Install each terminal and tighten each screw until there is zero play, then apply an additional 1/8th turn so that it is snug. Be sure to keep the spade terminal from rotating while turning the screw. *Do not* over-tighten or you will break the terminal strip.
5. Install the terminal strip covers. Again, don't over-tighten.
6. Connect the preamplifier or the other driving source to the Audio Palette input(s).
7. Connect the Audio Palette Main output to the amplifier input.
8. Connect the Audio Palette record outputs to the tape deck inputs.
9. Install the AC cable to the IEC mains connector on the rear of the Master Supply.
10. Connect the AC cable to the AC mains.

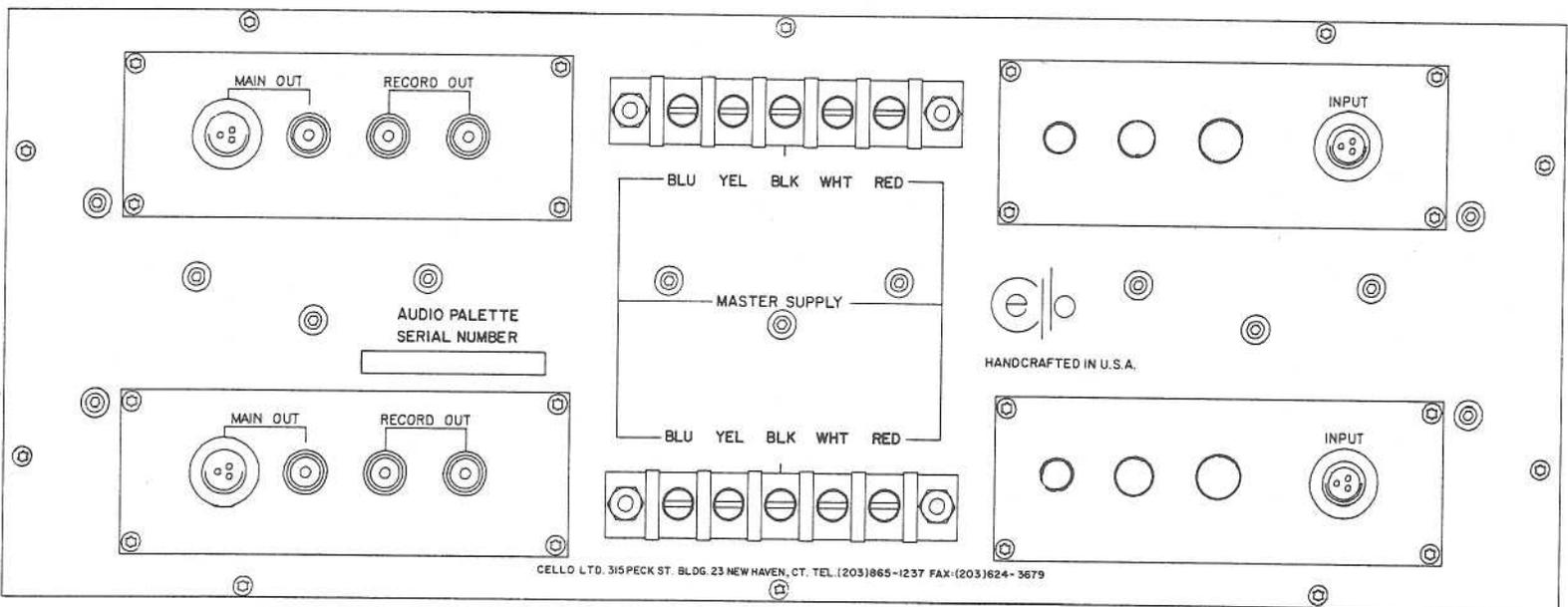
The Audio Palette may be driven by a preamplifier or directly from any line level source such as a CD player, tape recorder, or tuner.

See connection identification diagrams, figs. A1, A2, A3 and A4.

Standard Version



Multiple Input Version



Instructions (cont.)

OPERATION

Be sure to observe standard precautions when operating. The following steps are recommended.

1. Be sure all electrical connections are correct. Triple check them.
2. Be certain that terminal covers are installed.
3. Do not run power supply cables, AC mains or audio cables under rugs or sharp objects.
4. For systems including other makes of equipment without muting, set volume control of preamplifier to minimum. Now turn on preamplifier, then Audio Palette, then amplifier.

With the Audio Suite, select MAIN or MONITOR. Set volume control to desired listening level. With another type of preamplifier, adjust as you normally would for listening. Now, use the Audio Palette for all control of level and other functions.
5. To shut system down, turn amplifier off first, then Audio Palette, then preamplifier.
6. If physical damage has occurred to the unit or it is exposed to water or other liquids, do not use this device until proper repairs and/or integrity tests have been effected by authorized personnel.

INPUT IMPEDANCE

The input impedance of the Audio Palette can be changed by setting the dip switches for each channel. These switches are located under the top and bottom plates in the rear left corner.

The input impedance for the standard Audio Palette is factory set for 10kOhms, non-inverting input and 10kOhms inverting input. The MIV is factory set at 10k, 10k balanced and 1M, 10k single ended. If settings need to be changed refer to diagram A5 on page 1 I.

CONTROLS

The Audio Palette has two rows of controls. The top row adjusts input level, phase, blend, monitor/center, output level and (optional) functions. The monitor/center function is replaced by an input selector on the MIV. The bottom row adjusts the frequency response of the program material (music, speech, sound) in six ranges.

Input Level Controls

These controls have three uses. The first is as balance controls to compensate for either left or right channel level error. The second is to adjust the level of the equalized signal (adjusted frequency response) to be subjectively the same loudness as the input signal. The third is to lower input signals which need extreme amounts of boost at some frequencies, to avoid overload conditions. This would normally be likely only in a studio situation with high line level signals.

Absolute Phase Control

The phasing of a recording determines which direction your speaker cones or panels move for a given signal. If a recording of a kick drum is played, the initial kicks should push your speaker cones or panels out. This would be considered "in phase" (0 degrees). If a similar recording is played and the initial kick causes the cones or panels of your speaker to be pulled in, then the recording would be considered "out of phase" (180 degrees).

When a recording is made the signal can be inverted many times by the components in the record/reproduce chain. If the signal is inverted an even number of times, the final result will be in phase (0 degrees). If the signal is inverted an odd number of times, the final result will be out of phase (180 degrees).

There is no industry standardization at this time with regard to phase, so it must be monitored on a case-by-case basis. On some recordings the changes are too subtle to matter.

On others, the change is dramatic. Try listening in both 0 and 180 positions with a given recording. If it sounds more natural or more alive in one position, then use that setting.

Some recordings invert only one channel. Use the Left 180 or Right 180 position to correct for such rare flaws.

Equalization Control

OUT means that the input signal is going straight through without the six frequency controls having any affect. The OUTPUT LEVEL and ABSOLUTE PHASE controls are still active.

IN inserts the frequency controls as well as the INPUT CONTROLS. Use the INPUT LEVEL CONTROLS to adjust the loudness of the IN level to be subjectively the same as the OUT level. This enables you to evaluate the corrections you have made by referring at any time to the unequalized signal.

BLEND is the same as IN except that the low frequencies are blended below 40Hz for tighter bass and less noise with some recordings and systems. BLEND causes a slight lift at 20Hz in most cases. You may want to reduce the level of the 15Hz control when BLEND is selected by 2dB or so.

Monitor/Center Control (standard version)

The MONITOR/CENTER control on the standard version becomes active when certain options are selected. These are not user-retrofitable and must be installed at the factory or by a specialist.

The MONITOR/CENTER control is normally delivered inoperative with a knob which does not turn. This knob would become active with the factory installation of options implemented in the future such as filters or multiple outputs. They can be installed to factory specifications in the space provided.

Input Selector (MIV)

The input selector control permits selecting of either balanced or unbalanced line inputs.

Output Level Control

This control functions as the main level control of the system. It is calibrated in precise 1dB steps from +10dB to -40dB and then increments leading to full off.

Frequency Adjustments

25kHz control:

+/- 24dB in 1.00dB increments

5kHz control:

+/- 12dB in 0.50dB increments

2kHz control:

+/- 6dB in 0.25dB increments

500Hz control:

+/- 6dB in 0.25dB increments

120Hz control

+/- 14.5dB in 0.50dB increments

15Hz control:

+/- 29dB in 1.00dB increments

All frequency adjustments are made using the six controls in the bottom row on the front panel. They cover a broad range of sound which you will hear right away. To become familiar with the operation of the controls, turn them one at a time, starting with the 25kHz control and moving to the left, while a full-spectrum recording is playing. Turn each control counterclockwise, then clockwise, through the full range of the control to see its effect. Return each one to 0 before moving to the next adjacent control. To correct a recording of your choice, start with the 25kHz control and introduce a change which makes the sound more natural to your ears. Do not try to achieve perfection with one control. All controls must be adjusted in order to fully balance the sound in most cases. Go through them one at a time starting at the right (25kHz) and then go through again until no further improvements can be made. When you have

achieved the best sound, adjust the input level controls so that EQ IN and EQ OUT are at the same volume and compare them for final tweaking.

When high frequencies are added, the sound may be too thin until more low frequencies or other corrections have been added. Likewise, if the sound is muddy, then low frequencies might have to be reduced for other correction to sound right. Don't watch the control settings-listen to the sound of the music and adjust the controls so it sounds more real.

This approach really does work. Just relax and enjoy yourself. You are now free to make real improvements instead of being stuck with all the problems of recordings, equipment, and rooms which have limited musical realism in the frequency response and absolute phase domains.

The center frequencies for each control are given for reference, but the actual effect of a control is greater than can be shown by a single panel indication. In musical terms, the controls are active in the following areas:

25kHz: extreme high frequencies, overtones, air and spatial components, including upper parts of cymbals, strings, etc. This control does affect much more than just the upper most sounds-you will probably be surprised at how much you use it.

5kHz: the heart of the high frequency range, with a broad effect. Use in conjunction with the 25kHz control to achieve the best high frequency sound.

2kHz: the nasal area of voices and instruments is affected by this control.

500Hz: the "upper warmth" control can remove muddiness from some piano recordings, or warm up a sound which is too thin.

120Hz: a very powerful control which determines the "body" or "lower warmth" of the sound.

15Hz: the lowest bass information such as drums, organ pedals, string bass notes, etc.

Using Calibrated Controls

Until now, there has never been a fully calibrated, fully reproducible program correction and control center. Exact settings can be noted for discs, tapes, CDs, DATs, etc. and can be duplicated at a later date.

With all controls set to 0, the Audio Palette is a unity-gain device. Up to 15dB of gain is available, +5 at the INPUT LEVEL and +10 at the OUTPUT LEVEL. Normally, the INPUT LEVELS will be set between 0 and -6, and the OUTPUT LEVEL will be set between 0 and -10. Any gain setting is permissible as long as the guidelines in the instruction above have been followed.

If you have a home computer, you may want to enter corrections in a log for your record and tape collection, to store settings and choices for future reference. A small CRT at your listening position will do nicely.

Instructions (cont.)

CELLO LIMITED WARRANTY

Parts: Cello warranties all mechanical parts for five years and electronic parts for life.

Labor: Labor is the responsibility of the distributor except for the following: Any defective product during the first year shall be repaired by the distributor with labor paid by Cello according to factory rates for a given repair. At Cello's discretion, or if the distributor is unable to perform the repair, the unit may be returned to the factory for service using agreed-upon air freight. After repair, the unit will be returned by the same carrier or equivalent. During years 2-5, if the distributor is unable to perform the repair Cello will pay return air freight from the factory by agreed upon carrier provided the unit was shipped to the factory with air freight prepaid.

Cello will not pay freight if units are returned without a Return Authorization number (RA#). Cello will not pay freight if units are found to be in perfect working order.

WARRANTY OF REPAIR WORK

PERFORMED:

Any specific repairs or modifications effected by the factory or authorized service facility shall be guaranteed for 100% parts and labor for the remainder of the warranty period for the unit or one year (whichever is longer), except for electronic parts which carry a lifetime warranty.

PRODUCT REGISTRATION &

TRANSFERABILITY:

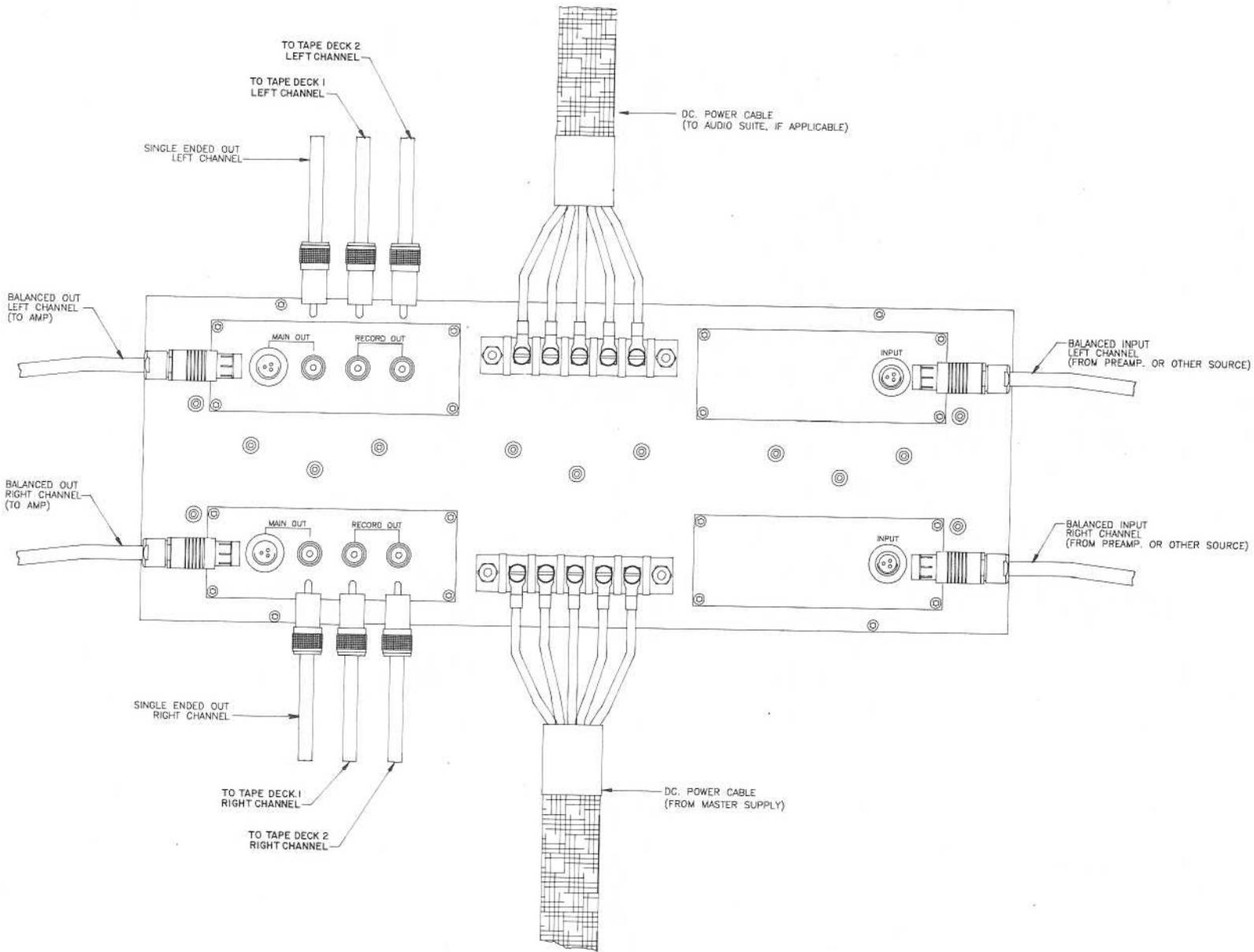
Distributors shall fill out the form on the outside of the carton when the goods are delivered to the retailer. The form should be sent to Cello, Limited. Warranty cards inside the box shall be completed by the retailer and customer respectively and returned to Cello, Limited within 30 days from the date of the sale to the customer. All products must be registered. When sold, new owners must be registered for the transfer of the warranty to be effected. All warranties are transferable to any succession of subsequent registered owners. Please contact your nearest authorized Cello supplier or the Customer Service Department at the factory for details of subsequent owner warranty registration.

TAMPERING/ABUSE/MISUSE:

Any unauthorized modifications, repairs or tampering, and/or any indications of obvious owner abuse, negligence or improper usage, as determined by Cello Limited shall be grounds to void the warranty.

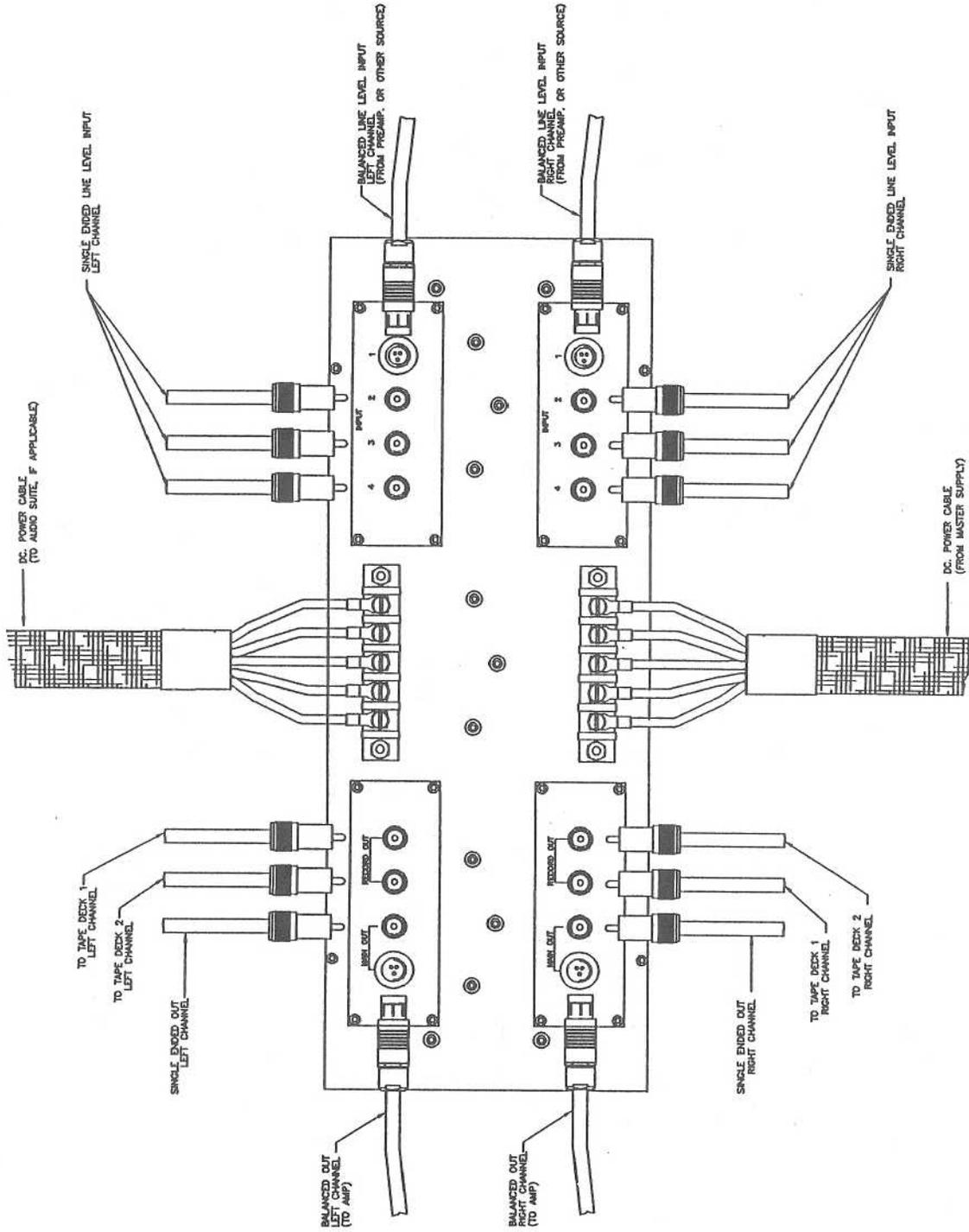
SERVICE:

If you believe your Cello equipment is not functioning properly, please call the Customer Service department at the factory. If you need to return your component, you will be given an R/A (return authorization) number. This number must appear on the outside of the shipping boxes. Returns without R/A numbers will not be accepted. Returns received in original Cello packaging will be returned in original packing. Returns received in non-Cello packaging will be returned in new Cello packaging at the owner's expense. If you need replacement packing materials, please contact the Customer Service Department at the factory.

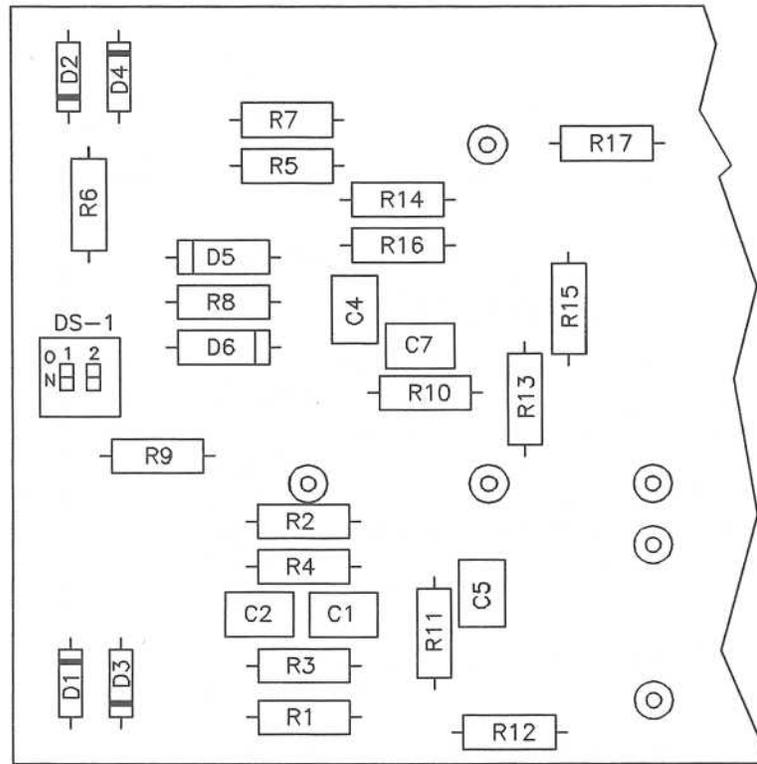


Standard Version

Multiple Input Version



Locator



Input Dip Switches Settings

Standard Version

Balanced Line Input
(One Channel)

DS-1

1 on	2 off	10K	0	10K
1 off	2 off	100K	4.5	10K
1 on	2 on	10K	11.6	1K
1 off	2 on	100K	14.7	1K

Multiple Input Version

Balanced Line Input
(One Channel)

*Position one is inoperative
DS-1

2 off	10K	0	10K
2 off	100K	0	10K
2 on	10K	11.6	for single
2 on	100K	11.6	ended use only

Single ended Input
(One channel)

*Position one is inoperative
DS-1

2 off	1M	9.4	10K
2 off	1M	9.4	10K
2 on	1M	16.7	1K
2 on	1M	16.7	1K

Physical Specifications

Audio Palette Dimensions

	ENGLISH	METRIC
Height (chassis)	7.1 in.	17.9 cm
Height (max.)	7.4 in.	18.9 cm
Width (chassis)	16.9 in.	42.8 cm
Width (max.)	19.0 in.	48.3 cm
Depth (foothold)	10.0 in.	25.4 cm
Depth (chassis)	12.0 in.	30.5 cm
Depth (max.)*	14.1 in.	35.7 cm

Box dimensions: 22.0" x 22.0" x 10.5"
55.9 cm x 55.9 cm x 26.7 cm

Weight: Net	26 lbs.	11.8 kg
Boxed	41 lbs	18.6 kg

All weights are approximate and do not include exterior cabling.
*Measurement from the rear of terminal strip covers to front plate

Cello, Ltd.

315 Peck Street, Bldg.23
New Haven, CT 06513 U.S.A.
203 867-4008 • FAX 203 867-4014