AB-100

Announcer's Console

INSTRUCTION MANUAL

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Clear-Com Systems

AB-100 ANNOUNCER'S CONSOLE

Instruction Manual

AB-100 Instruction Manual
Second Edition, November, 1994
This revision manual is for units manufactured after November 1, 1994
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Telephone: (510) 527-6666
Fax: (510) 527-6699

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Upon completion of repairs, equipment will be returned collect via United Parcel Service or other specified shipper.

NOTICE ABOUT SPECIFICATIONS

Performance specifications included in this manual are design-center specifications and are included for customer guidance and to facilitate system installation. Actual operating performance may vary.

BEFORE YOU BEGIN . . .

To get the most out of the AB-100 Announcer's Console, read this manual carefully. It will answer questions you might have about the operation and service of the components in the system. Clear-Com's Customer Service Department is available to answer questions not covered in this manual.

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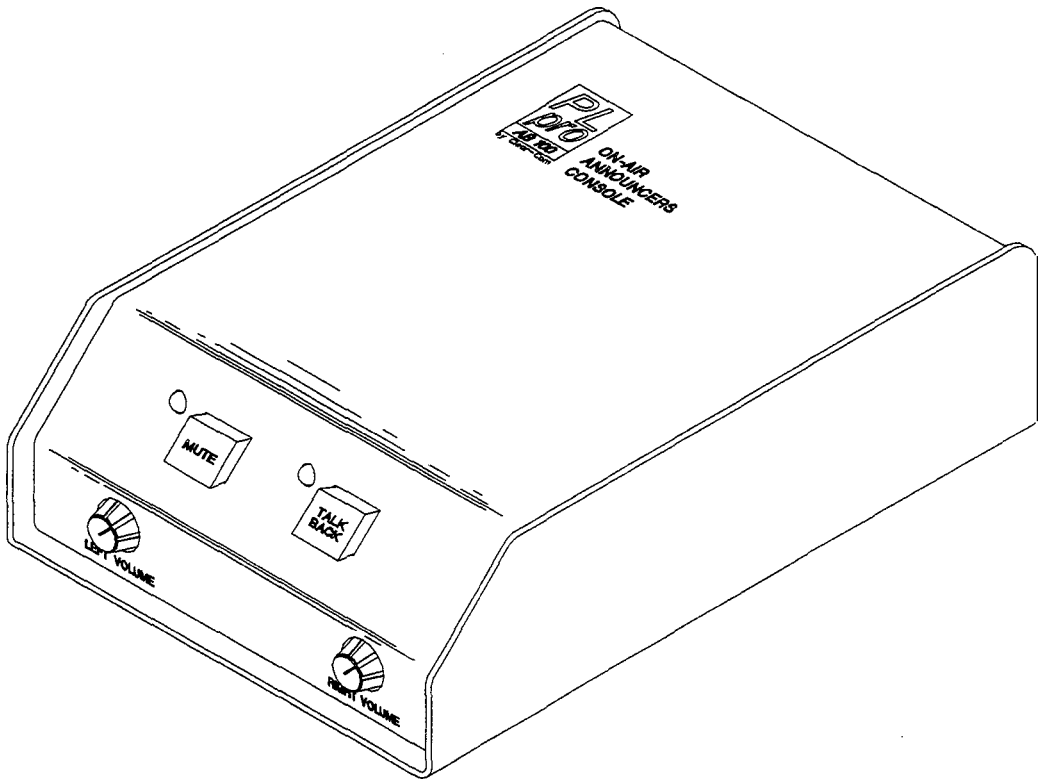
DESCRIPTION

The AB-100 Announcer's Console is a compact desktop unit designed specifically for sports and live event broadcasting. The AB-100 integrates all of the inputs, outputs and controls necessary at the announce position, including intercom "Talkback," IFB, and a "Mute" button.



A low-noise, low-distortion balanced microphone preamplifier delivers broadcast-quality sound from the announcer's microphone. The AB-100 can be used with virtually any broadcast headset or separate microphone/headphone. Mic gain is jumper selectable to accommodate all microphone types. The microphone output stage uses a high grade transformer for driving the line. Output levels from 0dB to -50dB are jumper selectable.

A high-output stereo headphone amplifier provides talent with both program audio and "cues" from the control room, even in the loudest of sporting environments. The console can be configured so that intercom audio and IFB inputs can be heard in the left ear, right ear, or both ears, helping the talent to instantly identify the source. The unit accepts one or two channels of IFB, which can be standard balanced audio or self-powered three-pin circuits like those found on most broadcast IFB systems.

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Instant access to a intercom system is available with a "Talkback" button. If the Talkback button is pushed, the microphone is momentarily switched from on-air duty to intercom use. The Announcer's Console can be connected to virtually any party-line or 4-wire intercom system. The AB-100 connects directly to Clear-Com party-line and Matrix Plus II digital intercom. A "mute" button (talent cough switch) provides momentary muting of the microphone. Alternately, it can be set to latch when pressed, allowing talent to switch the Mic on and off with a single touch. The switch is mechanically and electrically silent to ensure no clicking or switching noise when pressed.

An optional second channel of Talkback can be installed for TW-type intercom systems. The second channel is activated while the Mute button is pressed.

The AB-100 plugs into and draws power directly from most intercom and IFB systems, permitting an announce position to be located virtually anywhere, regardless of available AC power. When a powered intercom or IFB system is not available, the console can be externally powered with the supplied AC adapter or a DC source.

TECHNICAL SPECIFICATIONS:

MICROPHONE PRE-AMP:

Input Impedance	1K Ohms
Input Level	- 55 to -35dBv*
Frequency Response	100 Hz to 15 KHz, +/- 1dB
Electret Drive Voltage Option	10 Volts DC Aprox.
Condenser Mic Power Option	48 VDC Phantom

LINE LEVEL OUTPUTS:

Type:	Transformer Balanced
Level:	-10dBV* Nominal (Jumper and Pad Selectable)
Impedance:	To Drive 600 Ohm Line
Frequency Response:	20Hz -15KHz +/- 1dB
Distortion:	<0.05% THD at 100Hz - 10 KHz
Head Room:	+20dBV* before clipping

HEADPHONE AMPLIFIER:

Load Impedance:	greater than 8 Ohms
Output Level:	Max 4 Watts into 8 Ohms
Distortion:	<0.2% THD at 1 KHz
Frequency Response:	100-15KHz +/- 3dB
Gain from Intercom Line:	+37 dB

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BALANCED PROGRAM INPUT:

Type: ——— Transformer Balanced
Input Level Ref.: ——— -10 dBv*
Input Impedance: ——— 10 KOhms Bridiging
Frequency Response: ——— 150 Hz to 15 KHz

POWERED IFB INPUT:

Type: ——— 2 Ch Unbalanced, Transformer Isolated
Input Level Ref.: ——— -10 dBv*
Input Impedance: ——— 10 KOhms Bridiging
Frequency Response: ——— 150 Hz to 15 KHz

INTERCOM LINE DRIVE/RECEIVE CIRCUITS:

Impedance, Output Load: ——— > 10 KOhms (200Hz - 10 KHz)
Level, Line (200 ohm load): ——— -9 dBv* (nominal) +5dBv (max before clip)
Sidetone Null Capability: ——— > 25 dB (150Hz - 15 KHz)

CONNECTORS:

Headset: ——— XLR-6F
Mic Out: ——— XLR-3M
Intercom: ——— 2-XLR-3 (Male & Female Loop-thru)
IFB: ——— XLR-3F
Matrix Plus/AUX: ——— DB-15M
Power: ——— 2.1 mm Coaxial

POWER REQUIREMENTS:

Intercom/IFB:
Voltage ——— 25 - 30 VDC
Current ——— 65 mA idle, 120 mA average
AC Transformer: (115 VAC)
Voltage ——— 24 VAC @ 15 VA

PHYSICAL SPECIFICATIONS:

Dimensions: ——— 6"W x 3"H x 8"D (152mm x 76mm x 203mm)
Weight: ——— 2 lbs (0.9 Kg)
Operating Temperature Range: ——— 32-122° F (0-50° C)

* - 0dBv = 0.775 volts RMS.
(Specifications subject to change without notice.)

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INSTALLATION

The AB-100 is a versatile interconnection box, and as such many types of installations can be accommodated. This section describes the following subjects:

- FACTORY DEFAULT SETUP
- TWO MODES OF OPERATION
- HEADSET CONNECTION
- SELECTING MICROPHONE AMPLIFIER GAIN
- OPTIONS FOR POWER
- DETAIL DESCRIPTION OF CONNECTORS
- DESCRIPTION OF INTERNAL JUMPER OPTIONS AND ADJUSTMENTS
- APPLICATION TO VARIOUS INTERCOM SYSTEM TYPES
- INSTALLATION OF THE SECOND CHANNEL OPTION BOARD

NOTE: There are two versions of the Printed Circuit Board in the AB-100. This manual describes the units manufactured after November 1, 1994 with serial numbers greater than 565428. The two versions are functionally the same. The numbering of the internal jumpers is different.

FACTORY DEFAULT SETUP

As shipped from the factory, the AB-100 has its internal jumpers and dip switches set to implement the Clear-Com Party-Line setup described on page 15 of this manual. The unit is setup for SPORTSCASTER CONSOLE type operation and the Mic Output level is set for -20 dB. The unit will operate on power from the intercom line or from a wall-mounted transformer.

For variations on this factory default setup, read the rest of this chapter on Installation.

TWO MODES OF OPERATION

The logic circuitry of the AB-100 supports two basic modes of operation; Sportscaster's Console and Announcer's Console. The next two sections describe each.

SPORTSCASTER'S CONSOLE (Momentary Mic Mute)

To select the SPORTSCASTER MODE place a jump jack on pins 1 and 2 of JP11.

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In the "Sportscaster's Console" mode both front panel buttons are momentary in operation and microphone output is active except when either of the buttons is pressed. The Red Led next to the MUTE (left) button is illuminated whenever the mic output is active.

Pressing the MUTE button turns the output of the microphone circuit off as long as the button is pressed. If the optional second channel of Talkback is installed, it is activated while the Mute button is pressed.

Pressing the TALKBACK (right) button turns the output of the microphone circuit off and sends the microphone signal to the intercom line. The Green Led next to this button is illuminated when the talkback circuit is active.

ANNOUNCER'S CONSOLE (Latching Mic)

To select the ANNOUNCER MODE place a jump jack on pins 2 and 3 of JP11.

In the "Announcer's" mode the MIC ON/OFF (left) button is latching in action and the TALKBACK (right) button is momentary in action. The Red Led next the MIC ON/OFF button is illuminated whenever the mic output is active.

Pressing the MIC ON/OFF button toggles the state of the mic from On to OFF or from OFF to ON each time the button is pressed. NOTE: In the ANNOUNCER MODE use of the second talkback channel is not recommended. There is no indication when the second channel talkback is active. If the second talkback channel is used it is active only while the MIC ON/OFF button is pressed. Its active state does not follow the RED LED.

Pressing the TALKBACK (right) button turns the output of the microphone circuit off, resets the MIC ON/OFF latch to the OFF condition, and sends the microphone signal to the intercom line . The Green Led next to this button is illuminated while the Talkback circuit is active.

SELECTING MICROPHONE AMPLIFIER GAIN

The microphone preamplifier and the output line drive amplifier have selectable gains allowing the user to tailor the gain structure to the type of microphone being used and the desired output level. Refer to the block diagram on page 28 for a better understanding. As shipped from the factory, the microphone gain is set for a dynamic microphone and the output level is set for -20 dBV*.

The next paragraphs describe how to set the Microphone Amplifier Gain and how to select the line output level.

Microphone Preamplifier Gain

The microphone preamplifier gain must be set to provide proper operation of the limiter circuit used in the Talkback system. The preamplifier can be set for gains of 20, 30, and 40 dB. Dynamic microphones have a nominal output level of approximately -50 dBV. Electret and condenser microphones typically have an output level of -40 dBV. Some microphones have output levels as high as -30 dBV. Jumpers JP9 and JP10 allow selecting the microphone preamplifier gain at 20 dB, 30 dB, and 40 dB. See the table below for setting jumpers.

INPUT LEVEL	JP-9	JP-10
-50dB (Dynamic Mic)	1-2	1-2
-40dB (Electret Mic)	2-3	1-2
-30dB	2-3	2-3

Line Output Level Select

The operating level at the output is selectable to accommodate the various types of devices that are to be fed. The microphone input of a console would need -50 dBV whereas the line input of a console might need a level of -10 dBV.

Jumper JP8 allows the selection of three gain structures for the output amplifier and the output connector to the rear panel can be plugged into an alternate header on the printed circuit board that has a 30 dB pad inserted in the output. The combination of JP8 and the 30 dB pad allows an output level selection from 0 dBV to -50 dBV in 10 dB steps. See the table below for setting jumpers.

	0dB	-10dB	-20dB	-30dB	-40dB	-50dB
OUTPUT FROM	J2	J2	J2	J3	J3	J3
JP8 SELECTION	OPEN	2-3	1-2	OPEN	2-3	1-2

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OPTIONS FOR POWER

The AB-100 can be powered from the intercom line, the IFB line, or from a local wall-mount AC transformer. To power it from the intercom line or the IFB line the unit needs a minimum of 25 VDC. The AB-100 draws approximately 65 ma. of current with peaks of 150 ma.

If a condenser microphone is used and it is desired to phantom power the microphone with the internal 48 volt source it will be necessary to locally power the AB-100 with a wall mount transformer.

The following paragraphs describe how to power the AB-100 from the three different sources.

Power From The Intercom Line

To power the unit from the intercom line set a jump jack on pins 1 and 2 of JP5.

Power From The IFB Line

To power the unit from the IFB line, set jump jacks on pins 2 and 3 of JP5 and pins 1 and 2 of JP6 . JP5 selects where the positive DC power is sourced from. JP6 provides a ground return for the DC power.

If for noise reasons, pin 1 of the IFB input connector cannot be connected to power ground of the AB-100 (no jump jack in JP6) the power cannot be derived from the IFB line.

Power From An AC Wall Mount Transformer

If power from the intercom line or IFB line is not available or it is necessary to phantom power a condenser microphone then plug in the 110 VAC wall mount transformer supplied with the unit. An optional 220 VAC transformer is available upon request.

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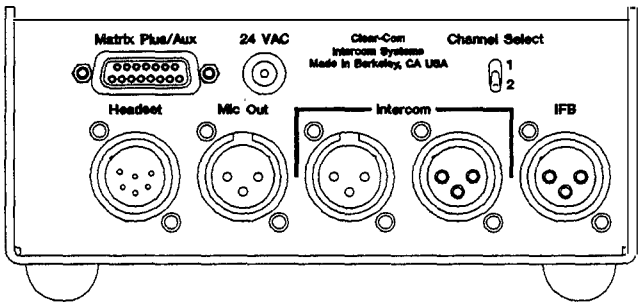
DESCRIPTION OF REAR PANEL CONNECTORS AND CONTROLS

The rear panel of the AB-100 has the following connectors and controls:

- Headset Connector
- Mic Out Connector
- A Male/Female Pair of Intercom Connectors
- IFB Input Connector
- Matrix/AUX Connector
- 24 VAC Power Connector
- Channel Select Switch



REAR VIEW

The rest of this section describes each in detail.

Headset Connector

STANDARD (As Shipped): The AB-100 is designed for use with any type of sportscaster or announcer headset. Connection is via a 6-pin female XLR style connector on the headset*. The pinout of the headset connector is as follows:

1 Microphone Lo (-)
2 Microphone Hi (+)
3 Headphone Common
4 Left Headphone (+)
5 Right Headphone (-)
6 Microphone Shield

*Switchcraft® Model # A6M or Neutrik® Model # NC6MXS

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The headset should have a separate shielded twisted pair of wires directly to the microphone, otherwise some earphone to microphone crosstalk may be experienced.

This connector is also 5-pin compatible, and as such certain standard intercom headsets are wired such that they will plug in directly. If a 5-pin headset connector is used some earphone to microphone crosstalk may be experienced so this option should only be used in emergency situations.

OPTIONS (Customer Supplied Modifications): The construction of the AB-100 lends itself to modification. The 6-pin XLR could be replaced with a 3-pin XLR and used to connect directly to various professional type microphones.

Next to the headset connector is a 1/4 inch hole intended for the user to install a 1/4 inch stereo phone jack for a separate set of headphones. Refer to the schematic on page 29 of this manual for suggested connections in these situations.

The 8-pin header on the printed circuit board that the headset connects to has circuits available for powering of electret and condenser microphones. Refer to the schematic on page 29 for suggested connections in these situations. If a condenser microphone is used and it is desired to phantom power the microphone with the internal 48 volt source, it will be necessary to locally power the AB-100 with a wall-mount transformer.

Mic Out Connector

The Mic Out connector provides a feed of microphone input after amplificaion. The connector is a XLR-3M. The pinout of this connector is as follows:

- Pin 1 --- Ground (Shield)
- Pin 2 --- + Mic Output
- Pin 3 --- - Mic Output

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Intercom Line Connectors (XLR-3 male & female):

The AB-100 has a male and female pair of XLR-3 connectors for the intercom line. The male-female pair of connectors are wired parallel and intended for loop-through connection.

The pinout of the Intercom Connectors when used with Clear-Com Party-Line systems is as follows (place the channel select switch in #2):

- Pin 1 --- Ground (Shield)
- Pin 2 --- Power (+25 to +30 VDC)
- Pin 3 --- Audio

The pinout of the Intercom Connectors when used with TW (RTS) type intercom systems is as follows (place the channel select switch to the desired channel):

- Pin 1 --- Ground (Shield)
- Pin 2 --- Audio #1 & Power (+25 to +30 VDC)
- Pin 3 --- Audio #2

IFB (XLR-3 female):

The AB-100 has female XLR-3 connector for the IFB input. The pinout of the IFB Connector is as follows:

- Pin 1 --- Ground (Shield)
- Pin 2 --- IFB #1 & Power (+25 to +30 VDC)
- Pin 3 --- IFB #2

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Matrix Plus/AUX (Rear Panel, DB-15M)

The Matrix Plus/AUX connector is intended for directly connecting a Clear-Com Matrix Plus system. Other 4-wire types of intercoms can also be used via this connector. The following is a description of each group of pins on the connector.

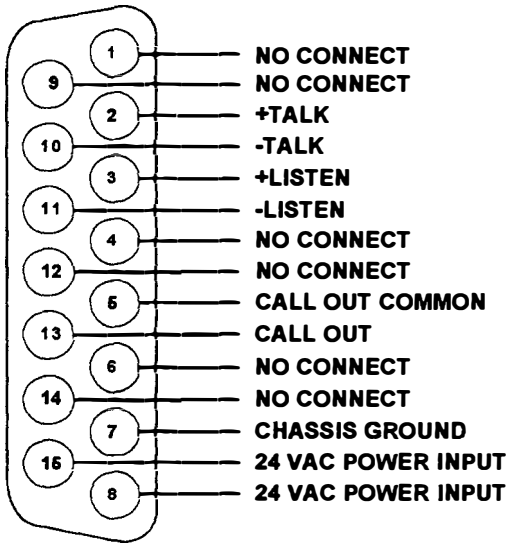
+/- TALK (Pins 2 & 10): The TALK pair is a 600 ohm (0 dB level) transformer balanced output that is active any time the TALKBACK button is active.

+/- LISTEN (Pins 3 & 11): The LISTEN pair is a 10 Kohm (0 dB level) transformer balanced input that is selected with jumper and dip switches. Refer to the application described on page 17.

CALL OUT (Pins 5 & 13): This pair of pins is an opto-isolated output intended to activate the CALL signal input of a Matrix-Plus port input whenever the TALKBACK button is pressed.

CHASSIS (Pin &): Chassis ground of the AB-100.

24 VAC POWER INPUT (Pins 8 & 15): A second method of entering external power into the AB-100. These pins are parallel to the 2.1 mm coaxial power connector that is normally used with the wall mount transformer.



Viewed from the rear of the connector

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DESCRIPTION OF INTERNAL JUMPER OPTIONS AND ADJUSTMENTS

The AB-100 has internal jumper options, connector selectable microphone output levels, dip switch selection of earphone output, and headphone sidetone adjustment controls.

As shipped from the factory, the AB-100 has its internal jumpers and Dip switches set to implement the Clear-Com Party-Line setup described on page 15 of this manual. The unit is set up for SPORTSCASTER MODE operation and the Mic Output level is set for -20 dB. The unit will operate on power from the intercom line or from a wall-mounted transformer.

All of these jumpers and Dip switch settings may need to be set depending on the application. The next section of this manual (APPLICATION OF VARIOUS INTERCOM SYSTEM TYPES) discusses four general types of applications and how to setup the AB-100 for each. The text here is for reference only in describing the function of each jumper and dip switch.

To gain access to the internal options, remove the bottom cover by unscrewing the four rubber feet first. If the second channel board is installed it may be necessary to remove the front two screws holding it in place and then swing it up out of the way on its hinged standoffs.

JUMPER OPTIONS

There are eleven two-position jumpers that provide many options for the operation of the AB-100. To access these jumpers, remove the bottom cover of the unit. Inside the bottom cover is a label describing the function of each jumper and dip switch. The following is a description of each jumper

JP1: JP1 provides termination for the intercom line if needed. The AB-100 is always a remote intercom station and therefore does not provide termination for an intercom line. This termination is provided for the cases where the party-line output of the AB-100 is not used and the party-line line drive circuit needs termination to be stable and not oscillate. As shipped from the factory the jumper is between pins 1 and 2 of JP1 making the termination inactive. To activate the termination, place the jumper between pins 2 and 3.

JP2 & JP3: JP2 and JP3 switch the second IFB input (first TW) from the IFB connector to the 4-wire listen input on the DB-15 connector. JP2 and JP3 should always be moved together. With the jump jacks in position 1 and 2, the input is from pins 1 and 2 of the IFB connector. With the jump jacks

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between pins 2 and 3, the input is from the DB-15 connector. As shipped from the factory, the jumpers are between pins 1 and 2.

JP4: JP4 selects which pin of the IFB connector the return for the first IFB input (2nd RTS) is on. If JP2 and JP3 are between pins 1 and 2 then JP4 should be between pins 1 and 2. If JP2 and JP3 are between pins 2 and 3 and it is desired to have a balanced input from the IFB connector, place the jumper on JP4 between pins 2 and 3. As shipped from the factory the jumpers are between pins 1 and 2.

JP5: JP5 allows the selection of the source of power for the AB-100. Placing the jumper between pins 1 and 2 of JP5 powers the AB-100 from pin 2 of the intercom connectors. Placing the jumper between pins 2 and 3 of JP5 powers the unit from pin 2 of the IFB connector. Refer to page 7 of this manual for more information.

JP6: JP6 provides options for the ground return pin of the IFB connector. JP6 is shipped from the factory with its jumper between pins 1 and 2 connecting pin 1 of the IFB connector to the internal ground of the AB-100. In some cases having pin 1 of the IFB connector grounded causes ground loops and in those cases the ground should be lifted (place the jump jack only on pin 2 to keep from losing it). In some situations it is possible that noise might be reduced by grounding pin 1 of the IFB connector to the chassis of the AB-100 (place the jump jack between pins 2 and 3).

JP7: JP7 allows the send gain on the talkback channel to be increased when driving a TW-type intercom line, such as RTS. Placing the jumper between pins 2 and 3 increases the send gain approximately 4 dB. JP7 is shipped from the factory with its jumper between pins 1 and 2, providing Clear-Com standard levels to the intercom line.

JP8: JP8 provides selection of desired output level for the microphone output. Refer to page 6 of this manual for detailed information.

JP9 & JP10: JP9 and JP10 select the gain of the microphone amplifier. Refer to page 6 of this manual for detailed information.

JP11: JP11 selects the SPORTSCASTER or ANNOUNCER modes of operation for the front panel pushbutton switches. Refer to page 4 of this manual for detailed information. Connection between pins 1 and 2 enables the SPORTSCASTER mode. Connection between pins 2 and 3 enables the ANNOUNCER mode.

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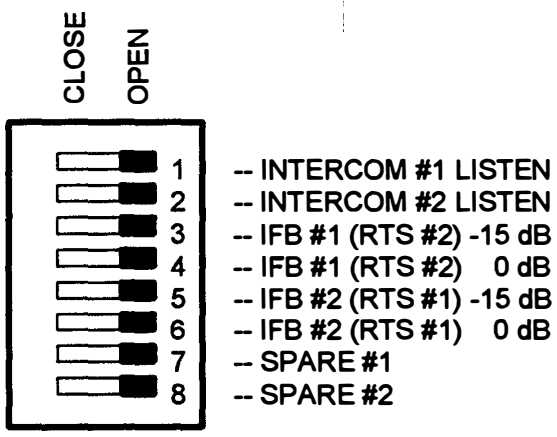
MICROPHONE OUTPUT PAD

The microphone output connector on the rear panel of the AB-100 can be internally plugged into two different headers on the main PCB. Connecting the output to J2 provides a high level output. Connecting the output to J3 adds a 30 dB pad in series to provide a lower level output. Refer to page 6 of this manual for more information.

DIP SWITCH SELECTION OF EARPHONE OUTPUT

Each earphone amplifier has an eight position dip switch providing a selection of inputs to that amplifier. S2 is for the Left Ear and S3 is for the Right Ear. Any or all of the inputs can be selected at the same time. The function of each dip switch is shown below.



DIP SWITCH SETTINGS FOR S2 AND S3

It will be noted that each of the IFB inputs has two dip switches, and each has different gains associated with it. Dip switch #4 is for a 0 dB input on that IFB channel. Dip switch #3 is for a lower level on the same IFB input. If the IFB source is a balanced input or from a TW-type system then the 0 dB setting should be used. If the IFB source is from a Clear-Com Party-Line system then the -15 dB setting should be used.

HEADPHONE SIDETONE ADJUSTMENT

If either Talkback channel is selected for listening in the headphone, adjust R41 on the main PCB or R6 on the second channel PCB for the desired amount of Talkback that is to be heard in the earphone.

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APPLICATION OF VARIOUS INTERCOM SYSTEM TYPES

The AB-100 is intended to work with virtually any intercom system. Options, jumpers and connectors have been provided for the following types of systems. This section describes how to implement each system type:

- Clear-Com Party-Line
- Matrix Plus Digital Intercom Systems
- TW Party-Line Systems (RTS)
- Other 4-wire Systems

Clear-Com Party-Line

An all Clear-Com Party-Line system would be described as follows:

IFB: IFB is provided by a PIC-4000B 2 channel (interrupt and non-interrupt) IFB system.

INTERCOM: Talkback is provided from one channel of a Clear-Com Party-Line system. This single channel is the "Producer Channel." Any announcer pressing his or her "Ttalkback" button would talk on this channel. Any or all of the announcers may talk at any time as they are summed on the party-line channel.

Set the Channel Select switch on the rear panel of the AB-100 to '2'.

POWER: Power for the AB-100 is derived from the intercom line, or optionally from the IFB line. Refer to page 7 for instructions about powering from the intercom or IFB lines.

ASSISTANT DIRECTOR IFB SYSTEM

SETTING JUMPERS:

JP-1 -- 1-2 (UNTERMINATE INTERCOM LINE)
JP-2 -- 1-2 (UNBALANCED #2 INPUT FROM IFB CONNECTOR)
JP-3 -- 1-2 (UNBALANCED #2 INPUT FROM IFB CONNECTOR)
JP-4 -- 1-2 (UNBALANCED #1 INPUT FROM IFB CONNECTOR)
JP-5 -- 1-2 (POWER INTERCOM LINE)
JP-6 -- 1-2 (CONNECT SHIELD OF IFB TO GROUND OF AB-100)
JP-7 -- 1-2 (CLEAR-COM INTERCOM LEVEL)
JP-8 -- MIC OUTPUT LEVEL (SET PER CHART ON PAGE 6)
JP-9 -- MIC PREAMP GAIN (SET PER CHART ON PAGE 6)
JP-10 -- MIC PREAMP GAIN (SET PER CHART ON PAGE 6)
JP-11 -- MODE SELECT (SEE DISCUSSION PAGE 4)

CHANNEL SELECT SWITCH: -- '2' unless second talkback channel installed.
'1' with second talkback channel installed.

SETTING DIP SWITCHES:

S2 (Left Ear Select)	S3 (Right Ear Select)
#1 -- OPEN(1)	#1 -- OPEN
#2 -- OPEN	#2 -- OPEN(2)
#3 -- CLOSE	#3 -- OPEN
#4 -- OPEN	#4 -- OPEN
#5 -- OPEN	#5 -- CLOSE
#6 -- OPEN	#6 -- OPEN
#7 -- OPEN	#7 -- OPEN
#8 -- OPEN	#8 -- OPEN

(1) If listen on the talkback channel is desired.
(2) If the second talkback channel is available and listen to it is desired.

WIRING OF CONNECTORS:

The pinout for the intercom XLR-3 connector is as follows:

Pin 1 -- Ground
Pin 2 -- +30 Volts Power
Pin 3 -- Intercom Audio

The pinout for the IFB XLR-3F connector is as follows:

Pin 1 -- Ground
Pin 2 -- IFB #2 (and power)
Pin 3 -- IFB #1

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Matrix Plus Digital Intercom Systems

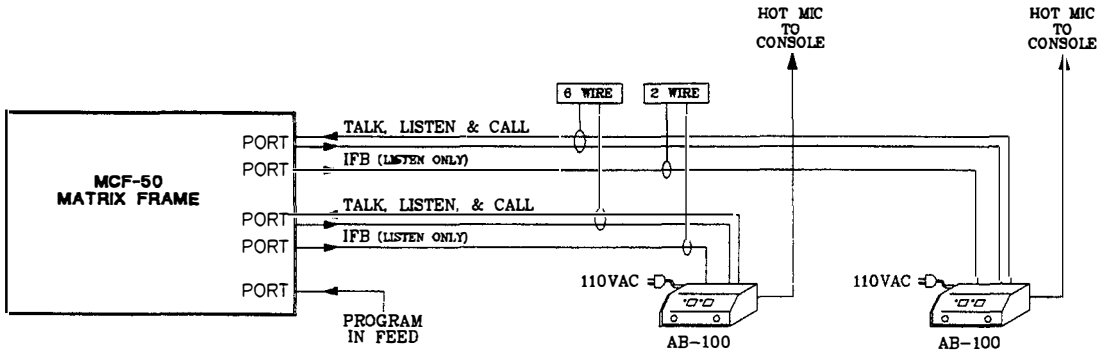
The Matrix Plus Digital Intercom system connects directly via the DB-15M on the rear panel of the AB-100. A description of such a system is as follows:

IFB: IFB is provided by a separate port of the Matrix Plus or an uninterrupted source such as an On-The-Air feed. This port output could be a standard port output directly form the matrix frame without an interface or it could be an output directly from an IP-50 interface panel connected to the expansion ports of a System III frame. Jumpers are set in the AB-100 to make the IFB input transformer balanced.

INTERCOM: Talkback is provided from a dedicated port on the Matrix Plus. The port is declared as a general purpose 4-wire port by connecting an ID jumper on pins 7 and 15 of the DB-15 Matrix port connector. The listen portion of the intercom port is sent to the left ear while the IFB input is sent to the right ear.

Alternately, a single port can be used for Program feed to the talent using the AB-100 and for Matrix communication to the talent with the talkback from the talent going into the Matrix port.

The Talkback button has an isolated logic output that can be connected to the CALL receive input of the Matrix Plus port. That port of the matrix should be set for a preset CALL Signal and Activate Crosspoints on CALL. Pressing the Talkback button on the AB-100 will cause the matrix to send a CALL signal to any ports that have been designated and close crosspoints for as long as the Talkback button is pressed.



AB-100 Connected To A Matrix Plus System

POWER: Power for the AB-100 is provided by an AC wall-mount transformer or a powered PL cable wether or not the Party-Line is used in the AB-100.

SETTING JUMPERS:

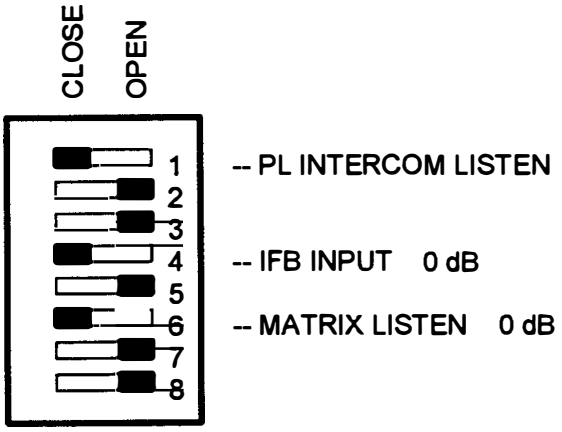
JP-1 -- 2-3 (TERMINATE UNUSED INTERCOM LINE)
JP-2 -- 2-3 (BALANCED INPUT FROM MATRIX CONNECTOR)
JP-3 -- 2-3 (BALANCED INPUT FROM MATRIX CONNECTOR)
JP-4 -- 2-3 (BALANCED INPUT FROM IFB CONNECTOR)
JP-5 -- 1-2 (POWER FROM PL INTERCOM LINE IF AVAILABLE)
JP-6 -- 2-3 (CONNECT SHIELD OF IFB TO CHASSIS OF AB-100
JP-7 -- DOES NOT APPLY (CLEAR-COM/RTS INTERCOM LEVEL)
JP-8 -- MIC OUTPUT LEVEL (SET PER CHART ON PAGE 6)
JP-9 -- MIC PREAMP GAIN (SET PER CHART ON PAGE 6)
JP-10 -- MIC PREAMP GAIN (SET PER CHART ON PAGE 6)
JP-11 -- MUTE BUTTON SELECT (SEE DISCUSSION PAGE 4)

CHANNEL SELECT SWITCH: -- '2'

If the second talkback channel is installed it will not be operational.

SETTING DIP SWITCHES:

Set the Dip switches for selection of what will be heard in each ear. S2 for the left ear and S3 for the right ear. Close = ON



DIP SWITCH SETTINGS FOR S2 AND S3

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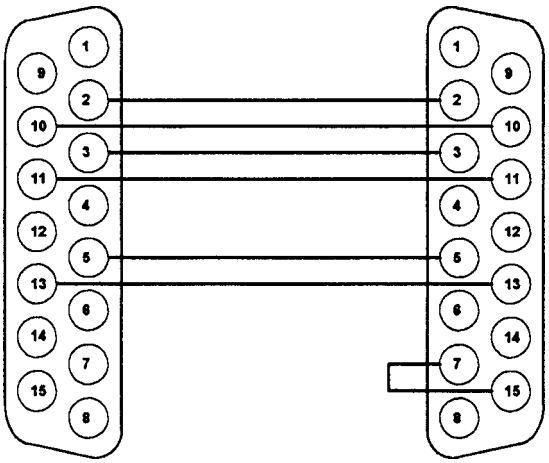
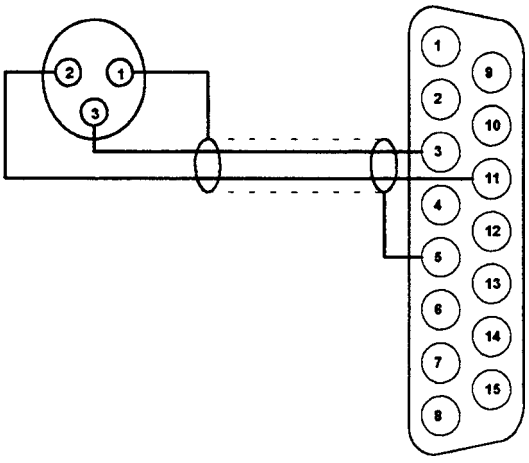
WIRING OF CONNECTORS: Make up the following cables to connect between the AB-100 and the Matrix Plus.

REAR OF DB-15F CABLE CONNECTOR ON AB-100 **REAR OF DB-15M CABLE CONNECTOR ON MATRIX**



INTERCONNECT CABLE BETWEEN THE AB-100 AND A MATRIX PLUS PORT

XLR-3M CABLE CONNECTOR ON AB-100 **REAR OF 15-15M CABLE CONNECTOR ON MATRIX**



IFB INTERCONNECTCABLE BETWEEN THE AB-100 AND A MATRIX PLUS PORT

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TW Party-Line Systems (RTS)

A TW party-line system would be described as follows:

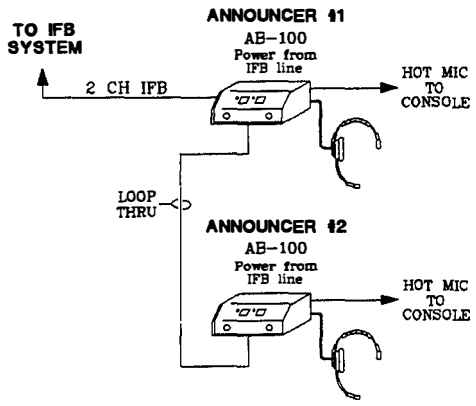
IFB: IFB is provided by a 2 channel (interrupt and non-interrupt) IFB system.

INTERCOM: Talkback is provided from one or two channels of a TW party-line system. Channel '1' is the "Producer Channel", any announcer pressing his or her "talkback" button would talk on this channel. Any or all of the announcers may talk at any time as they are summed on the party-line channel.

Set the Channel Select switch on the rear panel of the AB-100 to '1'.

If the second channel option is installed, any announcer pressing his or her "mute" button would talk on that channel.

POWER: Power for the AB-100 is derived from the intercom line, or optionally from the IFB line. Refer to page 7 of this manual for instructions about powering from the intercom or IFB lines.



AB-100 Connected To A TW Party-line System

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SETTING JUMPERS:

JP-1 -- 1-2 (UNTERMINATE INTERCOM LINE)
JP-2 -- 1-2 (UNBALANCED #1 INPUT FROM IFB CONNECTOR)
JP-3 -- 1-2 (UNBALANCED #1 INPUT FROM IFB CONNECTOR)
JP-4 -- 1-2 (UNBALANCED #2 INPUT FROM IFB CONNECTOR)
JP-5 -- 1-2 (POWER INTERCOM LINE)
JP-6 -- OPEN (LET COMMON OF IFB FLOAT)
JP-7 -- 2-3 (RTS INTERCOM LEVEL) & JP-1 ON THE OPTION BOARD IF USED.
JP-8 -- MIC OUTPUT LEVEL (SET PER CHART ON PAGE 6)
JP-9 -- MIC PREAMP GAIN (SET PER CHART ON PAGE 6)
JP-10 -- MIC PREAMP GAIN (SET PER CHART ON PAGE 6)
JP-11 -- MUTE BUTTON SELECT (SEE DISCUSSION PAGE 4)

CHANNEL SELECT SWITCH: -- '1'

SETTING DIP SWITCHES:

S2 (Left Ear Select)	S3 (Right Ear Select)
#1 -- OPEN(1)	#1 -- OPEN
#2 -- OPEN	#2 -- OPEN(2)
#3 -- CLOSE	#3 -- OPEN
#4 -- OPEN	#4 -- OPEN
#5 -- OPEN	#5 -- CLOSE
#6 -- OPEN	#6 -- OPEN
#7 -- OPEN	#7 -- OPEN
#8 -- OPEN	#8 -- OPEN

(1) If listen on the talkback channel is desired.
(2) If the second talkback channel is available and listen to it is desired.

WIRING OF CONNECTORS:

The pinout for the intercom XLR-3 connector is as follows:

Pin 1 -- Ground
Pin 2 -- Intercom Audio #1 and +30 Volts Power
Pin 3 -- Intercom Audio #2

The pinout for the IFB XLR-3F connector is as follows:

Pin 1 -- Ground
Pin 2 -- Audio #1
Pin 3 -- Audio #2

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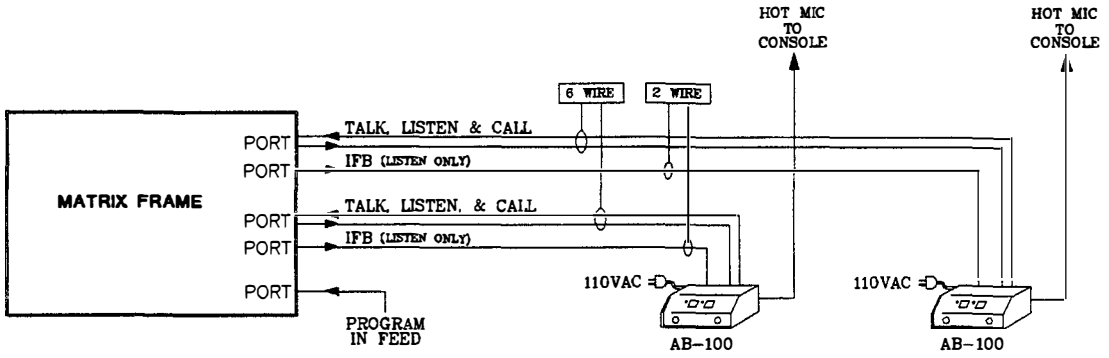
Other 4-wire Systems

A generic 4-wire intercom system can connect directly via the DB-15M on the rear panel of the AB-100. A description of such a system is as follows:

IFB: A single channel of IFB is provided by a separate 2-wire input. Jumpers are set in the AB-100 to make the IFB input transformer balanced.

INTERCOM: Talkback is provided from a 4-wire port of a point-to-point matrix system. The listen portion of the intercom port is sent to the left ear while the IFB input is sent to the right ear.

POWER: Power for the AB-100 is provided by an AC wall-mount transformer.



AB-100 Connected To A 4-Wire Matrix System

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SETTING JUMPERS:

JP-1 -- 2-3 (TERMINATE UNUSED INTERCOM LINE)
JP-2 -- 2-3 (BALANCED INPUT FROM MATRIX CONNECTOR)
JP-3 -- 2-3 (BALANCED INPUT FROM MATRIX CONNECTOR)
JP-4 -- 2-3 (BALANCED INPUT FROM IFB CONNECTOR)
JP-5 -- OPEN (POWER NOT FROM IFB OR INTERCOM LINE)
JP-6 -- 2-3 (CONNECT SHIELD OF IFB TO CHASSIS OF AB-100
JP-7 -- DOES NOT APPLY (CLEAR-COM/RTS INTERCOM LEVEL)
JP-8 -- MIC OUTPUT LEVEL (SET PER CHART ON PAGE 6)
JP-9 -- MIC PREAMP GAIN (SET PER CHART ON PAGE 6)
JP-10 -- MIC PREAMP GAIN (SET PER CHART ON PAGE 6)
JP-11 -- MUTE BUTTON SELECT (SEE DISCUSSION PAGE 4)

CHANNEL SELECT SWITCH: -- '2'

If the second talkback channel is installed it will not be operational.

SETTING DIP SWITCHES:

S2 (Left Ear Select)	S3 (Right Ear Select)
#1 -- OPEN	#1 -- OPEN
#2 -- OPEN	#2 -- OPEN
#3 -- OPEN	#3 -- OPEN
#4 -- CLOSE	#4 -- OPEN
#5 -- OPEN	#5 -- OPEN
#6 -- OPEN	#6 -- CLOSE
#7 -- OPEN	#7 -- OPEN
#8 -- OPEN	#8 -- OPEN

WIRING OF CONNECTORS:

The pinout for the DB-15M connector is as follows:

Pin 2 -- +Talk
Pin 10 -- -Talk
Pin 3 -- +Listen
Pin 11 -- -Listen

The pinout for the IFB XLR-3F connector is as follows:

Pin 1 -- Ground
Pin 2 -- +IFB
Pin 3 -- -IFB

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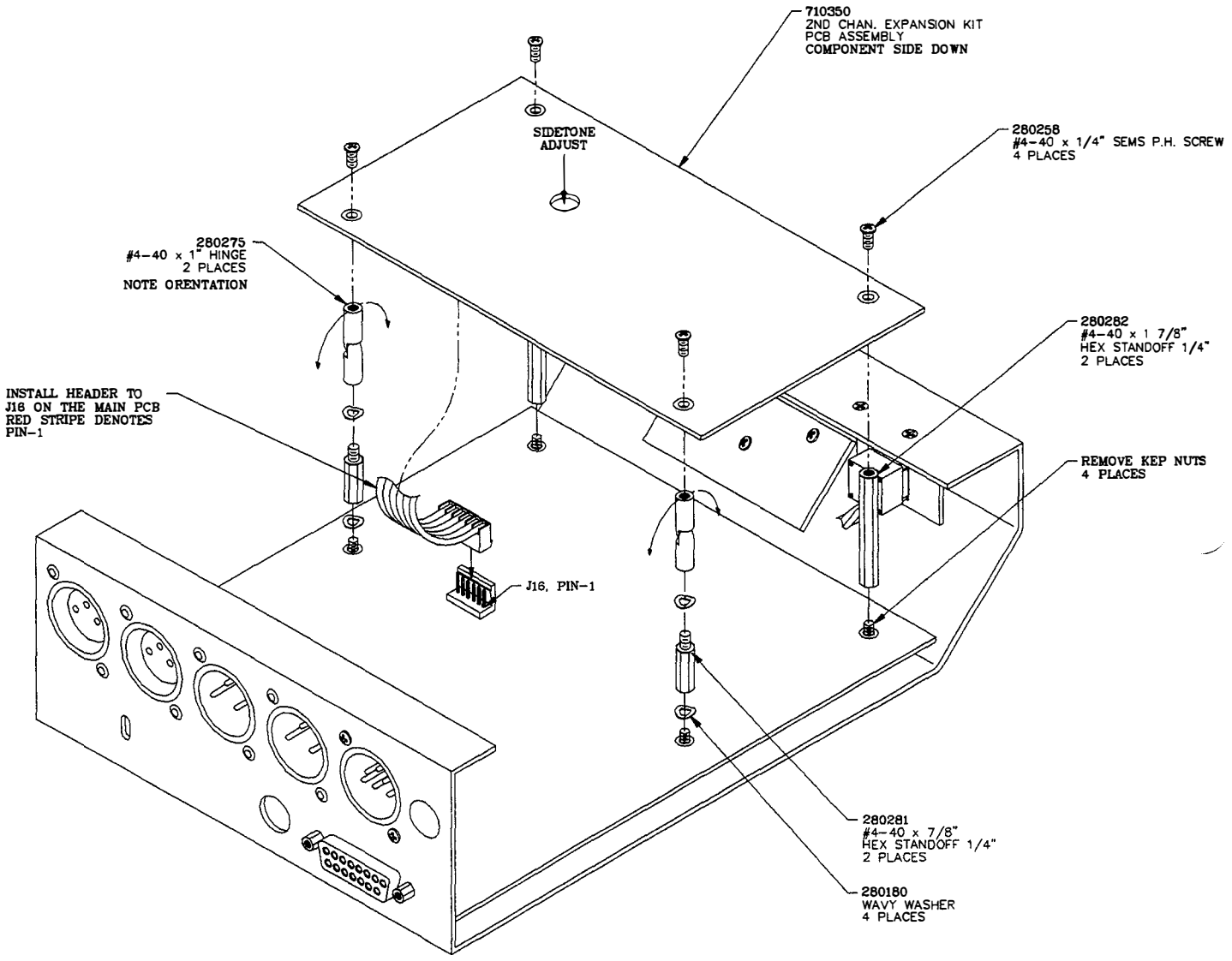

INSTALLATION OF SECOND CHANNEL OPTION PCB

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INSTALLATION OF SECOND CHANNEL OPTION BOARD

A kit that allows the implementation of a second intercom channel is available for the AB-100. It is Clear-Com part # 820073. If it is ordered at the time of purchase of the AB-100, it will be factory installed and tested. If it is ordered separately, the user will need to install the option.

The following instructions are for field installation of the second channel option kit. Refer to the illustration on the next page for details.

1 Remove the bottom cover by unscrewing the four rubber feet first.

2 Remove four #4 kep nuts holding the front portion of the main PCB down.

3 Replace the front two nuts with the two 1 7/8 inch standoffs supplied with the kit. Use two internal tooth lock washers next to the PCB. Tighten the standoffs very well.

4 Replace the rear two nuts with the two 7/8 inch standoffs supplied with the kit. Use two internal tooth lock washers next to the PCB. Tighten the standoffs very well.

5 Place the wavy washers on the two standoffs installed in the previous step. Screw the two hinged standoffs onto those standoffs. The hinged standoffs need to be very tight but care must be taken to turn the direction of swing of the hinge such that it swings from the front to the back of the unit.

6 Connect the ribbon cable of the second channel board into J16 of the main PCB.

7 Using the four 4-40 screws, mount the option PCB to the four standoffs.

8 Replace the bottom cover of the unit.

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OPERATION

Once installed and configured, the operation of the AB-100 is very simple. The action of the two front panel pushbuttons depends on the mode selected: SPORTSCASTER MODE or ANNOUNCERS MODE.

The volume controls operate the same in both modes. The control marked LEFT sets the listen volume in the left ear and the control marked RIGHT sets the listen volume in the right ear.

The operation of the pushbuttons and Leds are described for the two modes of operation:

SPORTSCASTER MODE

MUTE BUTTON (Left Button): Pressing the MUTE button turns the microphone output off while the button is pressed.

If the second intercom channel option is installed, the microphone output will be sent to the second talkback channel while the MUTE button is pressed.

MIC ON LED (Red): The red Led is on whenever the microphone input is being feed to its output.

TALKBACK BUTTON (Right Button): Pressing the TALKBACK button sends the microphone to channel 1 of the intercom circuits and turns off the microphone output.

TALKBACK LED (Green): When the green Led is on it indicates that the microphone is being sent to the first talkback channel.

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ANNOUNCERS MODE

MIC ON/OFF BUTTON (Left Button): Pressing the MIC ON/OFF button toggles the microphone output on if it was off and off if it was on.

NOTE: In the ANNOUNCER MODE use of the second talkback channel is not recommended. There is no indication when the second channel talkback is active. If the second talkback channel is used it is active only while the MIC ON/OFF button is pressed. Its active state does not follow the RED LED.

MIC ON LED (Red): The red led is on whenever the microphone input is being feed to its output.

TALKBACK BUTTON (Right Button): Pressing the TALKBACK button sends the microphone to channel 1 of the intercom circuits and turns off the microphone output. The MIC ON/OFF latch is also cleared such that it will be off when the TALKBACK button is released.

TALKBACK LED (Green): When the green led is on it indicates that the microphone is being sent to the first talkback channel.

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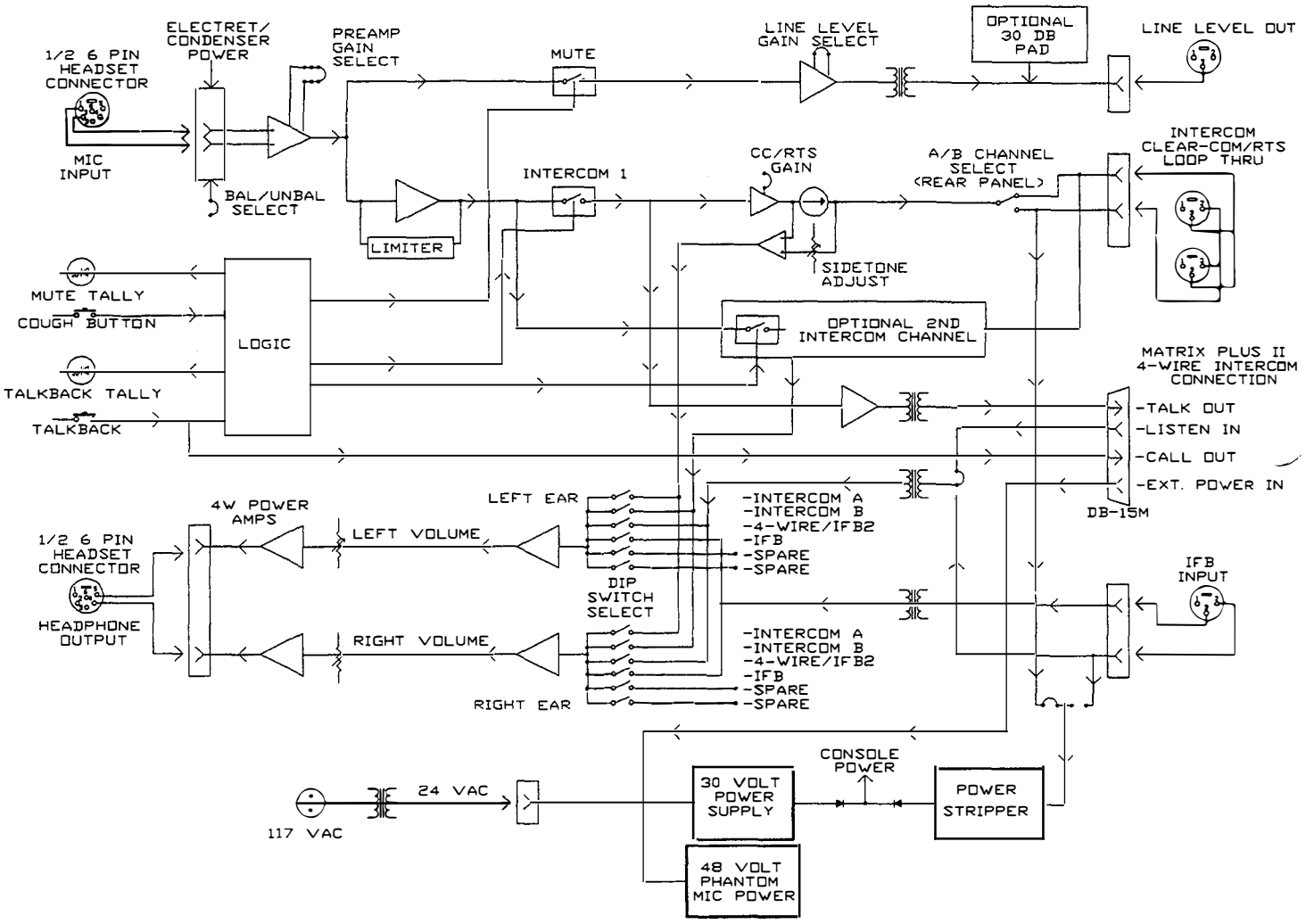

Block Diagram for the AB-100

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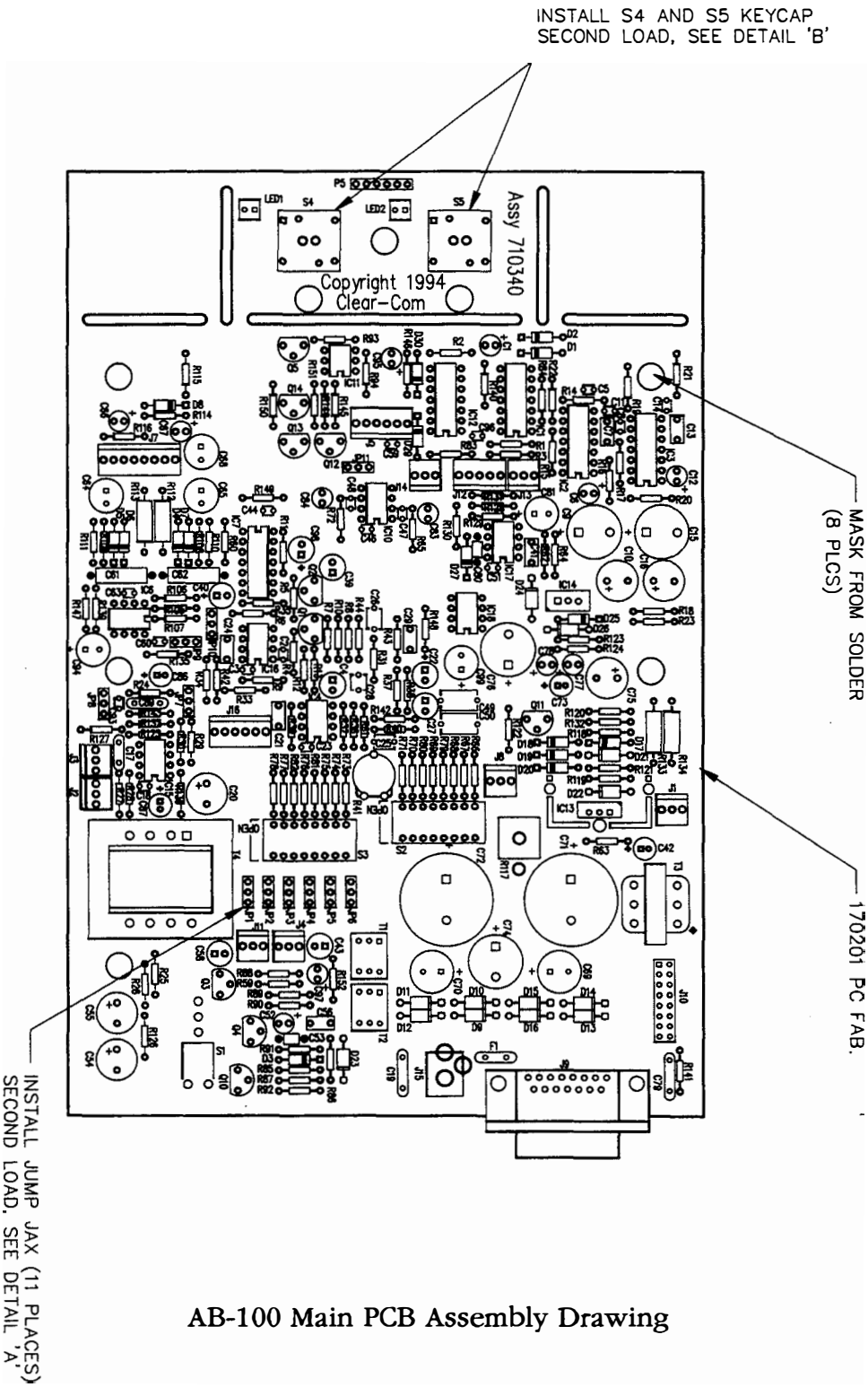

AB-100 Main PCB Assembly Drawing

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BILL OF MATERIALS OF MISC. CHASSIS PARTS

Device	Description	Part #	Designator
FOOT	RUBBER FOOT 3/4IN ROUND	240087	
POT	10K POT PANEL MOUNT	470073	
TRANSFORMER	110V/24V 0.4A WALL MOUNT	400007	

BILL OF MATERIALS FOR THE PCB ASY

Capacitors

Value		Type	Volts	Tol.	Part #	Designator
27	PF	CERAMIC	50V	5%	150071	C47,C48
39	PF	CERAMIC	50V	5%	150026	C17,C21,C24,C41,C56
100	PF	CERAMIC	50V	10%	150006	C2,C80
200	PF	CERAMIC	100V	5%	150063	C29
330	PF	CERAMIC	50V	5%	150025	C89
470	PF	CERAMIC	50V	10%	150014	C53
820	PF	MONOLITHIC	50V	5%	150101	C63
1000	PF	PLY	50V	2.5%	150119	C61,C62
.0022	UF	MYLAR	100V	5%	150045	C28
.0027	UF	MYLAR	50V	5%	150148	C7,C13
.01	UF	CERAMIC	1.4KV	20%	150029	C19,C59,C79
.047	UF	MYLAR	100V	5%	150131	C25,C26
.1	UF	MONOLITHIC	50V	10%	150035	C3,C5,C8,C11,C14,C18, C23,C44,C46,C51,C60,C96
.22	UF	MYLAR	100V	20%	150003	C49,C50
1	UF	ALUMINUM NP	50V	10%	150002	C4,C27,C39,C43,C58
4.7	UF	ALUMINUM NP	50V		150087	C22,C40,C83,C84
10	UF	ALUMINUM	50V		150064	C6,C12,C52,C78,C97
22	UF	ALUMINUM NP	50V		150150	C64,C65
22	UF	ALUMINUM	35V	20%	150152	C42,C73,C86,C87,C95
22	UF	ALUMINUM	16V		150010	C1,C66,C67,C77,C88
47	UF				150154	C68
100	UF	ALUMINUM	35V		150136	C81,C99
220	UF	ALUMINUM	35V		150021	C10,C16,C20,C54,C55,C75
220	UF	ALUMINUM	50V		150037	C69,C70
1000	UF	ALUMINUM	35V		150092	C9,C15,C74,C76
2200	UF	ALUMINUM	50V		150135	C71,C72 C18,C23,C44,C46

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Resistors

Value		Power	Type	Tol.	Part #	Designator
143	OHMS	1/4W	METAL FILM	1%	410187	R107
470	OHMS	1/4W	METAL FILM	1%	410190	R106
1.1K	OHMS	1/4W	METAL FILM	1%	410189	R105,R108,R109
11.0K	OHMS	1/4W	METAL FILM	1%	410191	R24
20.0K	OHMS	1/4W	METAL FILM	1%	410086	R32,R36,R40
26.1K	OHMS	1/4W	METAL FILM	1%	410192	R34
47.5K	OHMS	1/8W	METAL FILM	1%	410105	R33,R37
2.2	OHMS	1/4W	CARBON FILM	5%	410113	R14,R19
10	OHMS	1/4W	CARBON FILM	5%	410002	R85,R128,R148
22	OHMS	1/4W	CARBON FILM	5%	410004	R15,R20,R29,R30,R92
47	OHMS	1/4W	CARBON FILM	5%	410039	R25,R26,R110,R111
56	OHMS	1/4W	CARBON FILM	5%	410135	R89
100	OHMS	1/4W	CARBON FILM	5%	410071	R86,R121,R122,R135,R136
150	OHMS	1/4W	CARBON FILM	5%	410006	R63
220	OHMS	1/4W	CARBON FILM	5%	410007	R59,R90
240	OHMS	1/4W	CARBON FILM	5%	410060	R119,R123
270	OHMS	1/4W	CARBON FILM	5%	410009	R126
430	OHMS	1/4W	CARBON FILM	5%	410106	R38
470	OHMS	1/4W	CARBON FILM	5%	410042	R114
820	OHMS	1/4W	CARBON FILM	5%	410096	R94,R144
1K	OHMS	1/4W	CARBON FILM	5%	410010	R83,R84,R87,R88,R129, R147
1.2K	OHMS	1/4W	CARBON FILM	5%	410041	R16,R21
1.5K	OHMS	1/4W	CARBON FILM	5%	410055	R27,R28
2K	OHMS	1/4W	CARBON FILM	5%	410014	R31,R139
2.2K	OHMS	1/4W	CARBON FILM	5%	410011	R18,R23,R116,R118
3.3K	OHMS	1/4W	CARBON FILM	5%	410015	R17,R22
3.9K	OHMS	1/4W	CARBON FILM	5%	410012	R124
4.7K	OHMS	1/4W	CARBON FILM	5%	410013	R115,R125,R152
5.6K	OHMS	1/4W	CARBON FILM	5%	410056	R120
6.2K	OHMS	1/4W	CARBON FILM	5%	410137	R44
10K	OHMS	1/4W	CARBON FILM	5%	410016	R6,R7,R60,R61,R62,R68, R69,R70,71,R75,R76,R77, R78,R93,R132,R141
15K	OHMS	1/4W	CARBON FILM	5%	410017	R35,R42
22K	OHMS	1/4W	CARBON FILM	5%	410018	R130,R131,R145,R146, R149,R150,R151
24K	OHMS	1/4W	CARBON FILM	5%	410083	R4
33K	OHMS	1/4W	CARBON FILM	5%	410020	R13

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Resistors ..... continued

Value		Power	Type	Tol.	Part #	Designator
47K	OHMS	1/4W	CARBON FILM	5%	410021	R1,R2,R64,R137,R140
56K	OHMS	1/4W	CARBON FILM	5%	410023	R66,R67,R73,R74
91K	OHMS	1/4W	CARBON FILM	5%	410049	R79,R80,R81,R82
100K	OHMS	1/4W	CARBON FILM	5%	410024	R3,R8,R12,R39
120K	OHMS	1/4W	CARBON FILM	5%	410079	R43,R65,R72
470K	OHMS	1/4W	CARBON FILM	5%	410030	R9,R91,R143
1M	OHMS	1/4W	CARBON FILM	5%	410058	R11
2.2M	OHMS	1/4W	CARBON FILM	5%	410153	R10
47	OHMS	1/2W	CARBON FILM	5%	410134	R133,R134
6.8K	OHMS	1/2W	CARBON FILM	5%	410188	R112,R113
5	OHMS	5W	WIRE WOUND	10%	410051	R117

Integrated Circuits and Semiconductors

Device	Description	Part #	Designator
DIODE	1N957B ZENER 6.8V .4W 5%	480026	D8,D17
DIODE	1N4003 RECT 1A 200PIV	480058	D9,D10,D11,D12 D13,D14,D21,D22 D23,D24,D26
DIODE	1N4148 SIGNAL 10MA 75PIV	480000	D1,D2,D3,D4,D5 D6,D7,D18,D19,D20 D25,D27,D29,D30
I.C.	SSM-2017 BAL INPUT PREAMP	480207	IC6
I.C.	SSM-2402 DUAL SWITCH	480208	IC7
I.C.	4013 CMOS DUAL D FLIP FLOP	480171	IC12
I.C.	4584B CMOS HEX SCMITT TRIG	480090	IC1
I.C.	4N26 OPTO COMPILER	480106	IC11
LED	RED, ROUND T1-3/4 20-30 MA	480064	LED1
LED	GREEN, ROUND T1-3/4 20-30MA	390051	LED2
OP-AMP	RC4559NB DUAL OP AMP	480056	IC4,IC16
OP-AMP	LM741 IC OP AMP 8 PIN DIP	480018	IC18
OP-AMP	LM384 POWER OP AMP	480012	IC2,IC3
OP-AMP	LM833N DUAL 8 PIN DIP	480175	IC10,IC15,IC17
REGULATOR	LM317T POS ADJ 1.5A	480167	IC13,IC14
TRANSISTOR	MPS-A55 PNP 60V	480050	Q4,Q10,Q11
TRANSISTOR	2N4401 NPN 40V	480047	Q3
TRANSISTOR	J174 JFET PCHAN 8V VGS	480079	Q1
TRANSISTOR	2N2222 NPN 30V	480006	Q2,Q5,Q12,Q13,Q14

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Mics. PCB Parts

Device	Description	Part #	Designator
CONNECTOR	2.1MM CO-AX PC MTG POWER	210213	J15
CONNECTOR	DB15-M RT ANG PC MTG	210188	J9
FUSE	0.90A POLY SWITCH	520036	F1
JUMP JACK	JUMP JACK WITH HANDLE	210226	JP1-JP11
POT	5K TRIM POT H MTG.	470022	R41
SWITCH	PUSHBUTTON SWITCH	510108	S4,S5
SWITCH	SPDT RT ANG PC MTG	510098	S1
SWITCH	8 POS DIP SWITCH	510078	S2,S3
TRANSFORMER	600CT/600CT PAN MAG#TTC108	560018	T3
TRANSFORMER	10K:10K MINIATURE AUDIO	560034	T1,T2
TRANSFORMER	600:600 HI OUT LOW DISTORT	560038	T4

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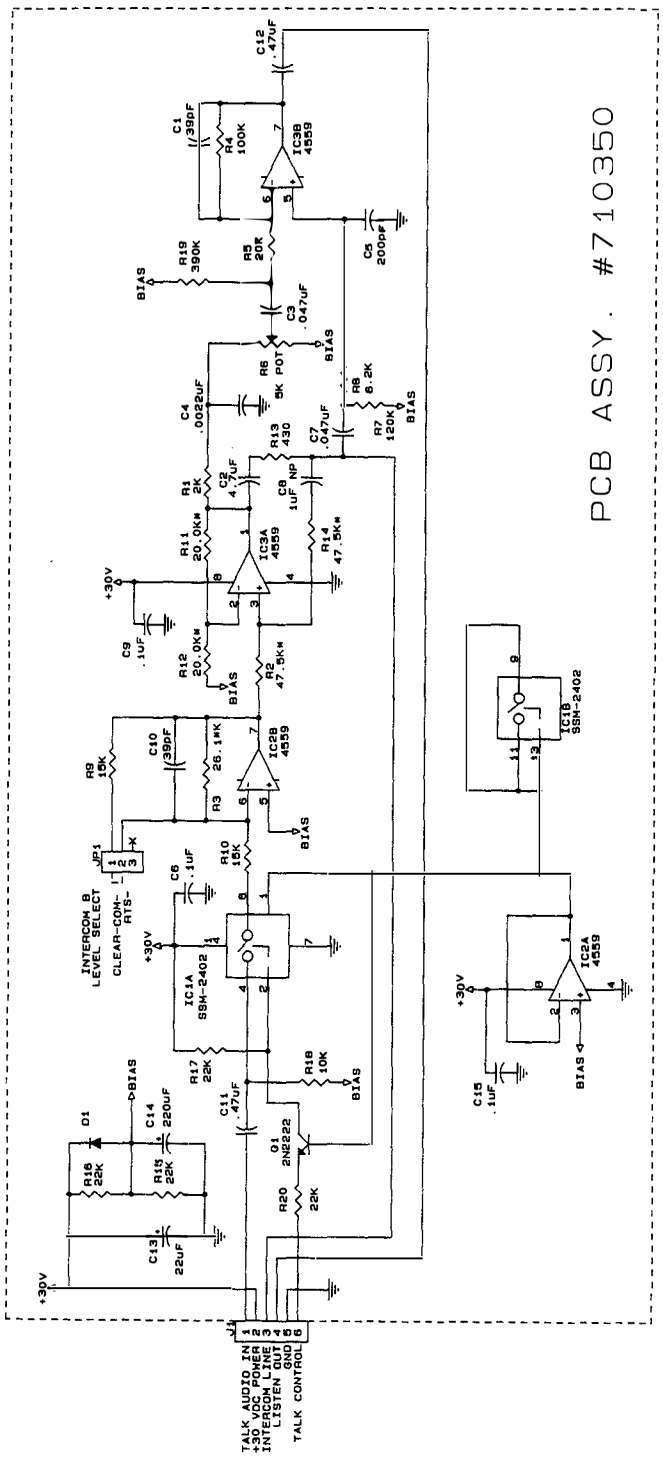
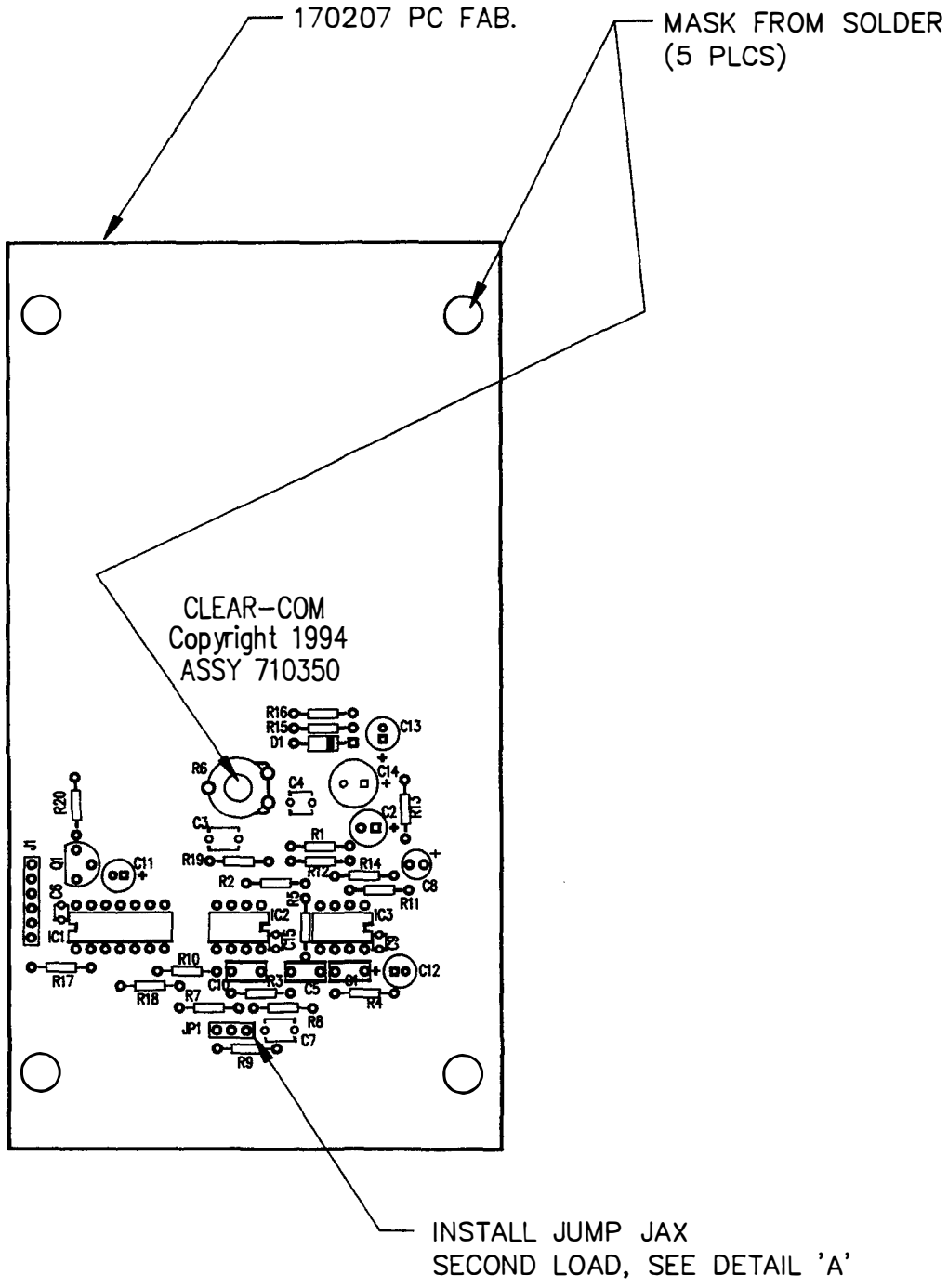


Schematic Diagram for the AB-100 Second Channel Option PCB



AB-100 Second Channel Option PCB Assembly Drawing

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BILL OF MATERIALS FOR THE 2ND CHANNEL OPTION PCB ASY

Capacitors

Value		Type	Volts	Tol.	Part #	Designator
39	PF	CERAMIC	50V	5%	150026	C1,C10
200	PF	CERAMIC	100V	5%	150063	C5
.0022	UF	MYLAR	100V	5%	150045	C4
.047	UF	MYLAR	100V	5%	150131	C3,C7
.1	UF	MONOLITHIC	50V	10%	150035	C6,C9,C15
.47	UF	ALUMINUM	50V		150024	C11,C12
1	UF	ALUMINUM NP	50V	10%	150002	C8
4.7	UF	ALUMINUM NP	50V		150087	C2
22	UF	ALUMINUM	35V	20%	150152	IC13
220	UF	ALUMINUM	16V	20%	150146	C14

Resistors

Value		Power	Type	Tol.	Part #	Designator
20.0K	OHMS	1/4W	METAL FILM	1%	410086	R11,R12
26.1K	OHMS	1/4W	METAL FILM	1%	410192	R3
47.5K	OHMS	1/8W	METAL FILM	1%	410105	R2,R14
430	OHMS	1/4W	CARBON FILM	5%	410106	R13
2K	OHMS	1/4W	CARBON FILM	5%	410014	R1
6.2K	OHMS	1/4W	CARBON FILM	5%	410137	R8
10K	OHMS	1/4W	CARBON FILM	5%	410016	R18
15K	OHMS	1/4W	CARBON FILM	5%	410017	R9,R10
20K	OHMS	1/4W	CARBON FILM	5%	410151	R5
22K	OHMS	1/4W	CARBON FILM	5%	410018	R15,R16,R17,R20
100K	OHMS	1/4W	CARBON FILM	5%	410024	R4
120K	OHMS	1/4W	CARBON FILM	5%	410079	R7
390K	OHMS	1/4W	CARBON FILM	5%	410029	R19

Integrated Circuits and Semiconductors

Device	Description	Part #	Designator
DIODE	1N4148 SIGNAL 10MA 75PIV	480000	D1
I.C.	SSM-2402 DUAL SWITCH	480208	IC1
OP-AMP	RC4559NB DUAL OP AMP	480056	IC2,IC3
TRASISTOR	2N2222 NPN 30V	480006	Q1

Mics. PCB Parts

Device	Description	Part #	Designator
JACK	JUMP JACK .1IN WITH HANDLE	210226	JP1
POT	5K TRIM POT H MTG.	470022	R6

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