HARRIS
ProCast

Operation Manual

Harris Corporation
Broadcast Communications Division
4240 Irwin Simpson Road
Mason, Ohio 45040-9478
1-800-622-0022

HARRIS
next level solutions

Broadcast Communications Division | 4393 Digital Way | Mason, OH USA 45040
phone: 513-459-3400 | 1-800-622-0022 | email: broadcast@harris.com | **www.harris.com**

1.0 DESCRIPTION

The ProCast is a full-featured audio mixing console ideally suited for the typical broadcast studio or any similar application. It features inputs for 3 microphones and 9 stereo line sources, two stereo mixing buses, a “mix-minus” output, a mono output, and comprehensive cue and monitoring systems. Other functions include an announce booth output with full duplex talkback, accurate audio level metering, remote control of mic channels and remote-start facilities on all line input channels.

2.0 INSTALLATION (See Figure 1 for connectors and controls (x) referenced in the text.)

2.1 AUDIO CONNECTIONS

2.1.1 MIC INPUTS

The ProCast has inputs for up to 3 microphones. Microphones should be low-impedance professional units with balanced outputs. Dynamic or ribbon mics are suggested. Powered condensor mics can be used, although the console does not provide phantom power. Connect microphones to the female XLR connectors (Fig.1, #1) on the rear of the console. The mic plug should be wired as follows:

PIN 1: Ground
PIN 2: High
PIN 3: Low

2.1.2 MIC PROCESS INSERT

The ProCast provides for the insertion of external microphone processing equipment, e.g., a mic limiter or equalizer. External mic processing equipment should be interfaced via the TRS Mic Process Insert jacks (Fig.1, # 2). These jacks provide a means of inserting processing gear just after the console’s mic preamps, but before the mic channel faders. The mic preamp output and return circuits are unbalanced, at a nominal level of –10dbm. Wire the mating TRS plug as follows:

TIP:	To processor input (from mic preamp output)
RING:	From processor output (to console fader input)
SLEEVE:	Ground

2.1.3 LINE INPUTS

The ProCast accommodates up to 9 stereo “line level” sources. Source equipment can be either balanced or unbalanced, operating at either professional (+4dBm) or consumer (-10dBm) levels. It is connected via the Line Input TRS jacks (Fig.1, #3). The upper jacks are for Left channel inputs; the lower jacks are for Right channel inputs. Mating TRS plugs should be wired as followed:

Unbalanced sources:	TIP:	High (or “hot” lead)
	RING:	(leave unconnected)
	SLEEVE:	Ground (or shield)
Balanced sources:	TIP:	High
	RING:	Low
	SLEEVE:	Ground

Note: The ProCast terminates the Low input to ground via a 1k Ω resistor. In some cases, connecting the Low audio lead to Ground will produce a slightly higher audio level. However, check the manual of the source equipment to be certain grounding the Low output lead will not cause damage. It is generally acceptable to do so on older transformer-coupled outputs; active (transformerless) outputs may or may not permit this type of grounding.

N O T E S

Purchase Date

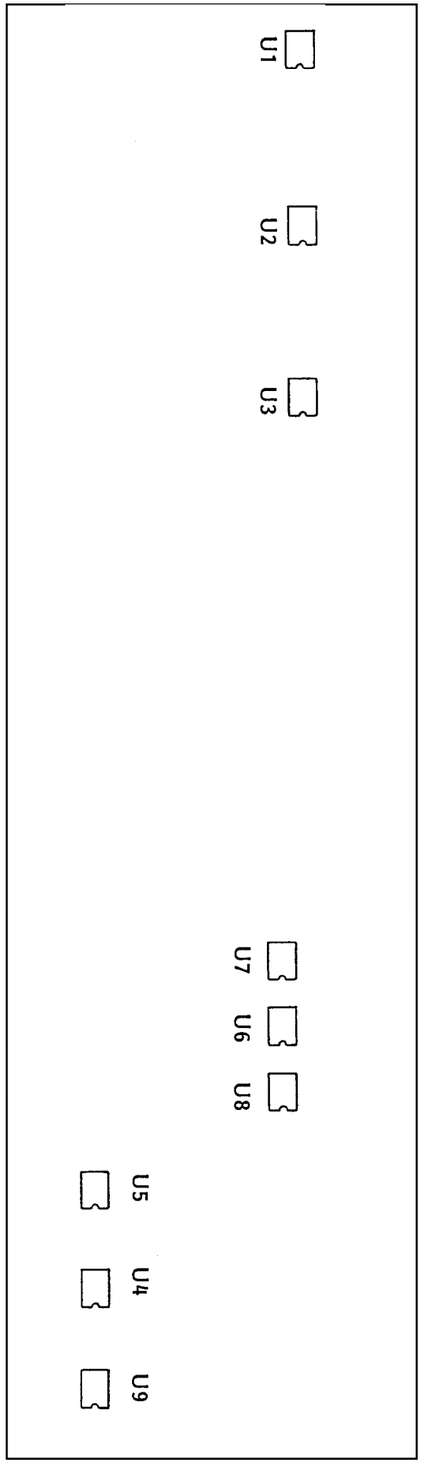
_____ / _____ / _____

Serial Number

_____

FIGURE 6

IC MAP: INPUT/OUTPUT BOARD



IC	PART #	FUNCTION
U1	SSM2017	MIC 1 PREAMP
U2	SSM2017	MIC2 PREAMP
U3	SSM2017	MIC 3 PREAMP
U4	NE5532N	PGM-L OUTPUT
U5	NE5532N	PGM-R OUTPUT
U6	NE5532N	AUD-L OUTPUT
U7	NE5532N	AUD-R OUTPUT
U8	NE5532N	MONO OUTPUT
U9	NE5532N	MIXMINUS OUTPUT

2.1.4 USING A TELEPHONE HYBRID

When interfacing a ProCast to a telephone hybrid (for broadcasting telephone calls), the Receive ("caller") output of the hybrid should be fed into Channel 4. This is because the Mix Minus output of the console contains ALL line sources mixed to the Program bus, *except for Channel 4.* The "Program-minus-caller" Mix Minus output is normally fed *back* to the hybrid's Send input. The callers will therefore be able to hear all program sources mixed on the Program bus, minus themselves.

2.1.5 AIR MONITOR INPUT

The ProCast provides an Air Monitor input (Fig. 1, #4) that can be used to feed an off-air monitor into the console's Monitor system. This input is electrically identical to the other Line channel inputs, and should be connected the same way. Any tuner or demodulator can be used.

2.1.6 MAIN MIX BUS OUTPUTS (PGM, AUD, MONO, MIX MINUS)

On the ProCast, the six main mixing bus outputs are on male XLR connectors (Fig1, #5). All outputs are electronically balanced; each will drive a 600 Ω load. The nominal level is +4dBm. Connect as follows:
PIN 1: Ground
PIN 2: High
PIN 3: Low
Note: To feed an *unbalanced* load, connect to Pins 1 & 2 only. *DO NOT SHORT PIN 3 TO GROUND!*
It is not necessary to terminate any console outputs.

2.1.7 MONITOR OUTPUT

The ProCast Monitor output (Fig.1, #6) is via a TRS jack. This output is unbalanced, and will drive a 600 Ω load. (Termination is not necessary.) The nominal level is –10dBm. Connect the mating TRS plug as follows:

TIP:	Left Monitor output
RING:	Right Monitor output
SLEEVE	Ground

2.1.8 BOOTH OUTPUT

The ProCast provides a secondary output for Booth monitor (Fig.1, #7) that can be used to drive headphones worn by an announcer in an "announce booth". This output, via TRS jack, will drive headphones of 300 Ω or higher. (Termination is not necessary.) The nominal output level is 0dBm. The mating TRS plus should be wired as follows:

TIP:	Left Booth output
RING:	Right Booth output
SLEEVE:	Ground

2.1.9 CUE/TALKBACK OUTPUTS

The ProCast provides outputs to drive external *amplified* speakers for monitoring the Cue bus and Talkback circuit (Fig. 1, #8). Using the Cue output is optional, as the Cue bus can be monitored via the Monitor system (with the CueMix function) as well as via the Phones output. The Talkback output must be connected to an external (amplified) speaker if this feature is to be used. The Cue and Talkback outputs are unbalanced and will drive 600 Ω loads to a nominal level of –10dBm. (Termination is not necessary.) Inexpensive "computer speakers" are ideal for use with the Cue and Talkback outputs (audio quality unimportant). The mating TRS plug should be wired as follows:

TIP:	Cue output
RING:	Talkback output
SLEEVE:	Ground

2.2 CONTROL INTERFACE

2.2.1 MIC 2 & 3 REMOTE CONTROL

The ProCast provides for remote control of Mic 2 & Mic 3 via the Mic 2 & 3 Remote Control connector (Fig.1, #9). This 15 pin, DB15 connector should be wired according to Figure 2.

Note that there are two ways to install “cough switches” for Mics 2 & 3. The cough switches wired between pins 9 & 10 (for Mic 2) and pins 13 & 15 (for Mic 3) should be used if these mics will be controlled (switched on and off) by the console operator. The switches can be located either at the console for use by the console operator or in an announce booth for use by an announcer. If these switches are not needed, jumpers must be installed as shown between pins 9 & 10 and between pins 13 & 15.
IMPORTANT! Mics 2 & 3 will not operate if these jumpers are missing.

Cough switches can also be installed wired in series with remote mic ON/OFF switches. Note that they will function only if the mic is turned on via the remote ON switch. This configuration would apply only if the mics will be controlled (switched on and off) from a remote location, such as an announce booth. If the “cough switches” are *not* used, jumper wires must be installed in their place.

LED’s can be used to show “Mic ON”; be sure to include the 1k Ω resistor as shown. (This value can be changed to set LED brightness.)

The Talkback function allows the booth announcer to talk directly to the console operator (off-air) via the Talkback system.

The MUTE TALLY output provides a means of switching external equipment when the monitor mutes. This circuit goes to ground (low) when the monitor is muted. It can be used to operate “ON AIR” warning light controllers, such as a Henry Engineering “SupeRelay” unit.

2.2.2 LINE CHANNEL REMOTE CONTROL

The ProCast provides 9 momentary SPST switches than can used for “remote start” of line channel source equipment, e.g., CD players, tape decks, etc. Interface to these switches is via the Line Channel Remote Starts connector (Fig.1, #10), a 25-pin, DB25 connector. WARNING: The maximum voltage that can be applied to Remote Start switches is 24Vdc @ 100mA or less. DO NOT EXCEED THIS RATING. **NEVER CONNECT THESE CIRCUITS TO A 110 VOLT AC LINE!** Connect the mating 25-pin, DB25 connector according to Figure 3.

2.3 POWER INPUT

Plug the external power supply of the ProCast into the Power jack (Fig.1, #11). Do not use any power supply not supplied with the console. The power supply is a “universal input” type, and can be used with any AC input voltage between 100 and 250 VAC, either 50Hz or 60Hz. No changes to the power supply are needed. The AC mains cord must have a connector appropriate for the AC socket being used.

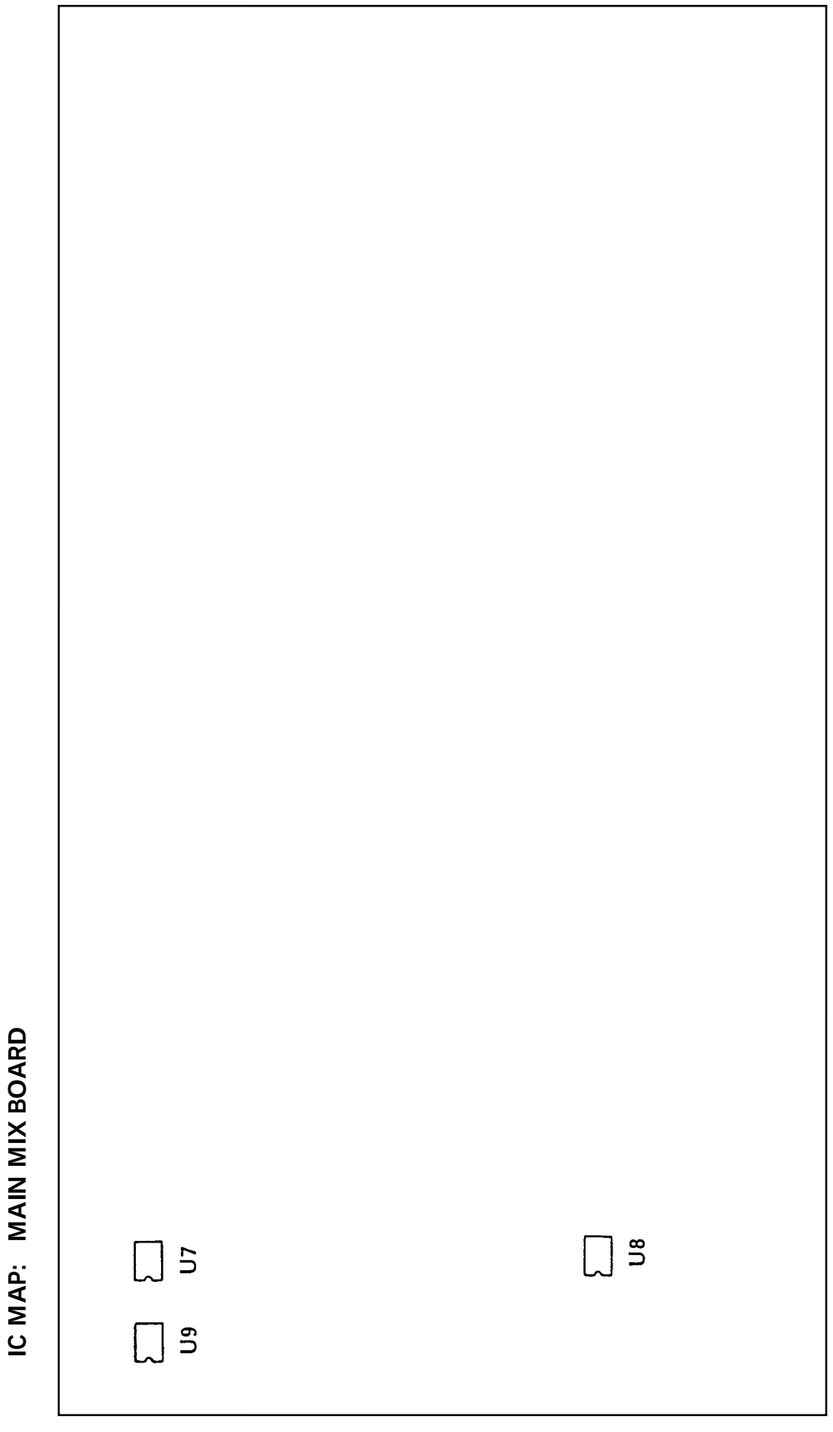
3.0 ADJUSTMENTS AND SETUP

3.1 GAIN ADJUSTMENT, MIC CHANNELS

Each of the 3 Mic input channels has a GAIN adjustment (Fig.1, #12) to optimize the mic preamp gain for the microphones being used. The gain can be varied over a 20dB range. Use a small screwdriver to adjust the gain trimmers as needed. Mic gain is properly adjusted when the preamp output, accessible via the TIP of the Mic Process Insert TRS jacks (Fig.1, #2) is about –10dBm when speaking into the microphone. To quickly set mic gain, follow these steps:

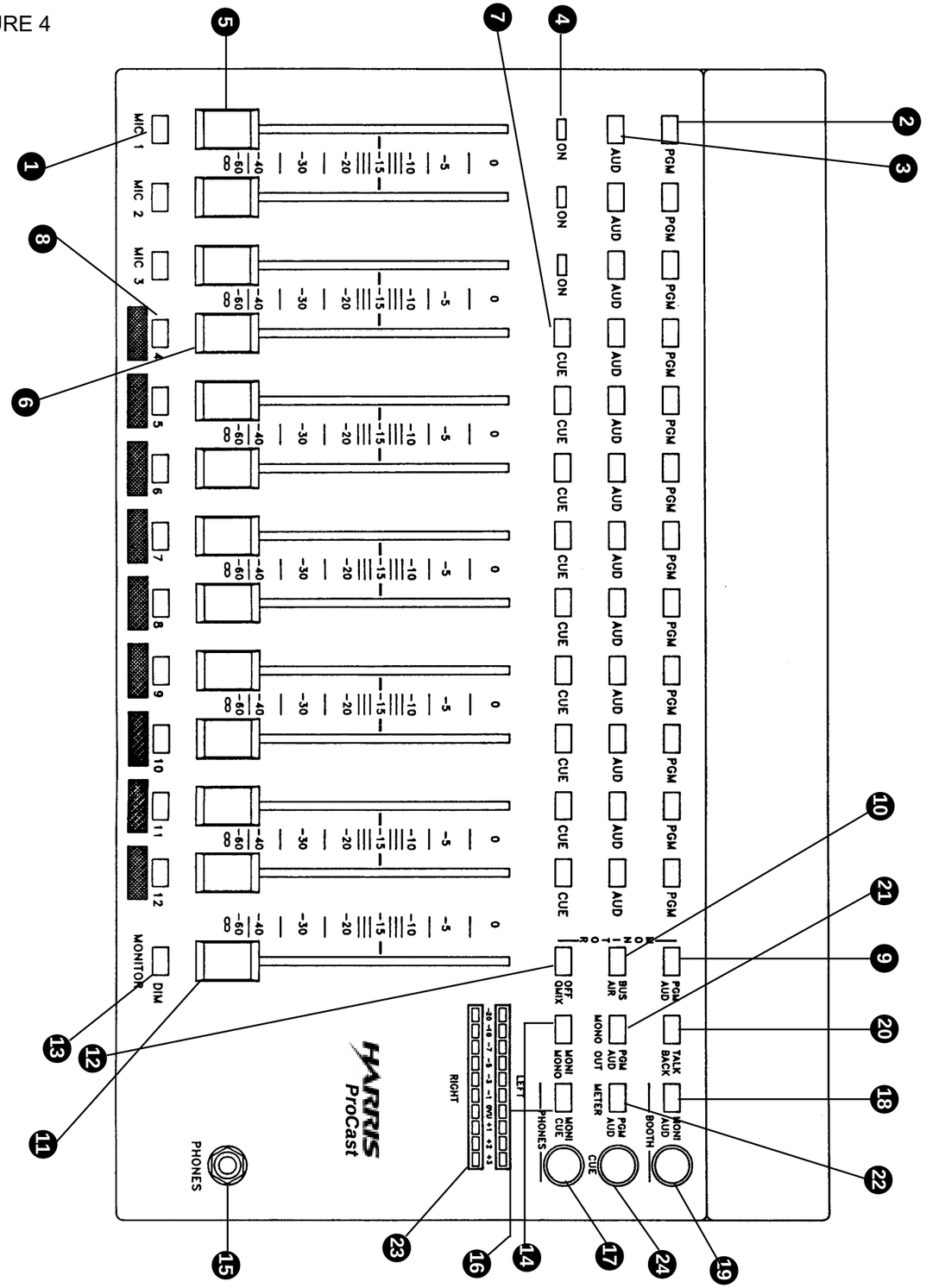
1. Assign the Mic channel to the Program bus
2. Set the Mic channel fader to –15db.
3. Speak into the microphone; set the gain so that the VU meters peak about O VU.

FIGURE 5



IC	PART #	FUNCTION
U7	NE5532N	MONITOR L+R OUTPUTS
U8	NE5532N	PHONES L+R OUTPUTS
U9	NE5532N	BOOTH L+R OUTPUTS

FIGURE 4



3.2 MIC CHANNEL MONITOR MUTE PROGRAMMING

The Monitor system on the ProCast can be programmed so that when Mic 2 and/or Mic 3 are on, the audio output from the Monitor system is muted. If Mic 2 or Mic 3 are on, and are located in the same studio as the Monitor speakers, the Monitor system should mute to prevent acoustic feedback. Programming Mic 2 and/or Mic 3 to mute the Monitor system can be done by installing jumper wires on the Mic 2 & 3 Remote Control
connector, (Fig.1, #9). For proper connection, see Figure 2. To enable Mic 2 monitor mute, install a jumper between pins 3 & 11. To enable Mic 3 monitor mute, install a jumper between pins 7 & 11.

3.3 TALKBACK MIC INPUT

The ProCast includes a Talkback system that permits the console operator to speak to an announcer who is wearing headphones connected to the Booth output. When the TALKBACK button (Fig 4., #20) is pressed, the “normal” audio being fed to the Booth output is interrupted and is overridden by audio from the Talkback circuit. Because Mic 1 is normally used as the “console operator mic”, Mic 1 is used to talk back to the Booth announcer. Another audio source can be substituted for Mic 1 (e.g., an intercom output) if necessary. See both Figure 2, and (Section 2.2.1). The jumper between pin 12 and pin 8 should be removed. External Talkback audio can be fed into pin 8. This input is unbalanced; the nominal input level should be about –10dBm.

3.4 GAIN ADJUSTMENT, LINE CHANNEL

Each of the 9 Line channel inputs on the ProCast has an Input Sensitivity switch (Fig.1, #13) that must be set according to the source equipment being used with each Line channel input. There are two settings: OUT and IN. Set the switches OUT for professional levels, e.g., +4dBm or +8dBm; set switches IN for use with “consumer” equipment operating at about –10dBv. (The Line channel inputs are bridging and will not load source equipment.)

4.0 OPERATION (See Figure 4 for controls (x) referenced in the text.)

Operation of the ProCast is simple and straightforward. Audio sources can be mixed to the Program and/or Audition buses. Line channels can be also be fed to the Cue bus. The console’s outputs can be monitored via headphones, the Monitor system and the VU meters. A separate Booth output can feed headphones used by a booth announcer. The console operator can talk to the booth announcer using the Talkback function; the booth announcer can respond using the Talkback feature in the announce booth.

4.1 MIC INPUT CHANNELS

Mic channels are switched on and off using the Mic ON/OFF buttons (Fig.4, #1). When a mic is on, the “ON” LED (Fig.4, #4) will be illuminated. Mic audio can be assigned to the Program bus using the PGM button (Fig.4, #2). The AUD button (Fig.4, #3) assigns mic channel audio to the Audition bus. Both buses can be used simultaneously. The relative mix level is determined by the FADER (Fig.4, #5). The “normal” position is –15dB, which yields 15dB of “in hand” gain.

Mic 1 is pre-wired to mute the Monitor system when Mic 1 is on. Mics 2 and 3 can be wired by the user to mute the Monitor system if necessary. (See Section 3.2.)

4.2 LINE INPUT CHANNELS

Line channels are assigned to the Program and/or Audition bus using the PGM buttons (Fig.4,#2) and AUD buttons (Fig.4,#3). Both buses can be used simultaneously. Line channels can be “previewed” by using the Cue bus. Pressing the CUE button (Fig.4,#7) will send the audio to the Cue system (pre-fader). Cue audio can be heard either through the Monitor system (by using the CueMix feature), through the Phones output, or through an external Cue speaker. NOTE: The Program and/or Audition assignments are still active even when the Cue bus is being used. To prevent preview audio from getting on the air, be sure to lower the fader before using the Cue function. The relative mix level of line sources is determined by the FADER (Fig.4,#6). The “normal” position is -15dB, which yields 15 dB of “in hand” gain. Line channel source equipment can be remotely started using the START button (Fig.4,#8) directly below each line channel fader.

4.3 MONITOR SYSTEM

The console's main mix buses (PGM, AUD, and CUE) can be monitored via the Monitor system. In addition, audio from an off-air monitor can be heard through the Monitor system. A unique feature of the ProCast is the "CueMix" system, whereby audio on the CUE bus can be heard through the Monitor system, providing the console operator Cue bus audio that is superior to that coming from the traditional "cue speaker" found on most other consoles. Other Monitor functions include the ability to switch the Monitor output to monaural (to check for phase errors) and a DIM switch (Fig.4, #13) that instantly attenuates the Monitor output by 20dB.

Two buttons determine what is normally heard on the Monitor system. The PGM/AUD button (Fig.4, #9) selects either the Program or Audition bus. If the button is up, the Program bus is heard; if the button is down, the Audition bus is heard, *provided that* the BUS/AIR button (Fig.4, #10) is *up.* If the BUS/AIR button is down, the PGM/AUD selection is overridden, and the audio source fed into the Air Monitor input will be heard. This is normally fed with an off-air demodulator or tuner for monitoring the station's transmitted signal.

The Monitor system volume is adjusted using the Monitor FADER (Fig.4, #11). The (external) monitor amplifier should be adjusted so that the Monitor system produces adequate volume with the Monitor fader set to about -15dB.

The MONI MONO button (Fig.4, #14) combines the Monitor output to monaural. This is useful for checking mono compatibility of stereo signals. Note that this button affects *only* the monitor audio; it has *no effect* on the main mix bus outputs.

4.4 CUE SYSTEM AND "QUEMIX"

One unique feature of the ProCast is the CueMix system. This allows the console operator to listen to audio signals on the CUE bus through the main monitor speakers, rather than the usual small ineffective "cue speaker" found on most broadcast consoles.

To use the CueMix feature (for example, to preview a track on a CD), follow these steps:

1. Put the channel with the CD player's signal into CUE, by pressing it's CUE button (Fig.4, #7).
2. Turn the CueMix feature ON, by pressing the QMIX button down. (Fig.4, #12)
   The Monitor system will dim, reducing "normal" bus audio by 20dB; CUE bus audio will be heard through **the right monitor speaker**. Adjust Cue audio level using the CUE LEVEL control (Fig.4,#24). Preview the source as needed.
3. Once the CD is "ready for air", release the QMIX button and the CUE button for the CD player channel. The Monitor system will return to normal operation.

The Cue system can also used in a "conventional" manner with the addition of an external (amplified) cue speaker, connected via the CUE/TB output jack. (See Section 2.9.) The audio level at this jack is controlled by the CUE LEVEL control (Fig.4, #24). This Cue output mutes whenever the Monitor system is muted.

The cue bus can also be heard via the console operators PHONES output. (See Section 4.5)

4.5 PHONES OUTPUT

The console operator can monitor the console's Monitor output via the PHONES jack (Fig.4, #15). Medium-impedance headphones of 300 Ω or higher can be used. Do *not* use older 8 Ω headphones. The MONI/CUE button (Fig.4, #16) determines what is heard through the headphones. If this button is up, the headphones will "follow" whatever audio source is selected for the Monitor system. If the button is down, the headphones will monitor the Cue bus. The PHONES knob controls headphone volume (Fig.4, #17).

FIGURE 3
"REMOTE START" CONNECTIONS

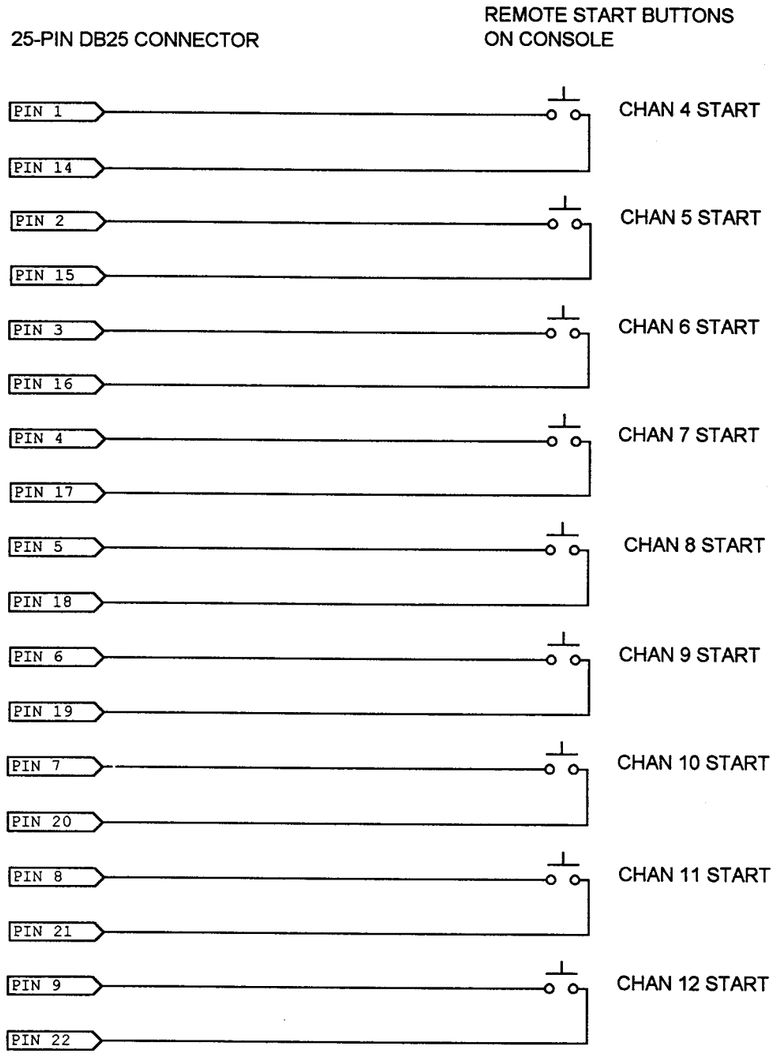
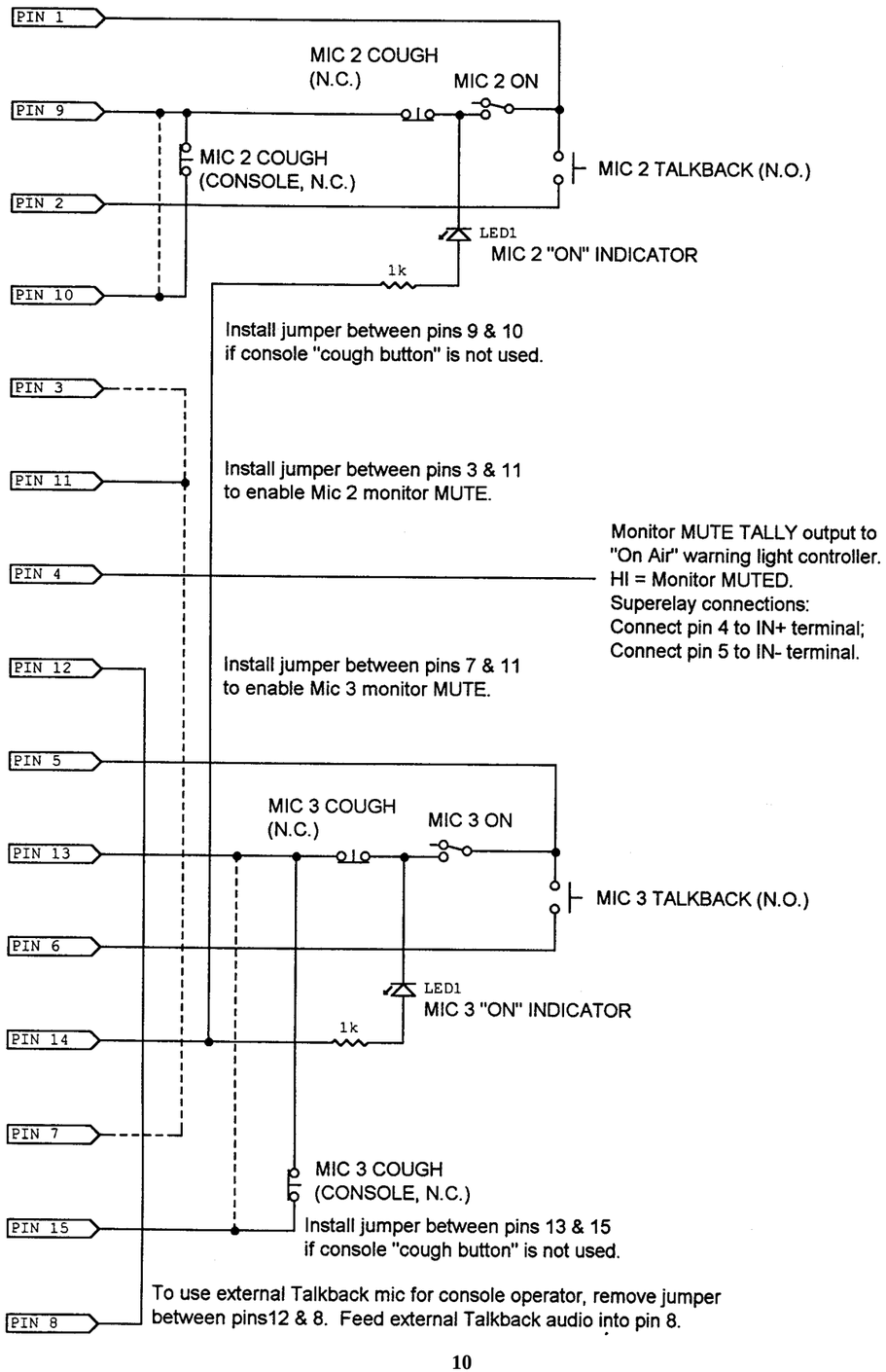


FIGURE 2
MIC 2 & 3 REMOTE CONTROL

15-PIN DB15 CONNECTOR



4.6 BOOTH OUTPUT

The ProCast provides a secondary headphone output for use by an announcer in an “announce booth”. The MONI/AUD button (Fig.4, #18) determines what can be heard by the booth announcer. If the button is up, the announcer will hear the same audio heard by the console operator via the Monitor system. If the MONI/AUD button (Fig.4, #18) is down, the announcer will hear the Audition bus output. This allows the Audition bus to be used to create a special “announcer mix”. The Booth headphone level is adjusted with the BOOTH control (Fig.4, #19). Use headphones with an impedance of 300 Ω or higher. Do *not* use older 8 Ω headphones.

4.7 TALKBACK SYSTEM

The ProCast includes a full-duplex Talkback system that allows the console operator to converse with the booth announcer, off-air. (To use the system in duplex mode, an external amplified speaker must be connected to the TB OUTPUT as described in Section 2.1.9.) If the TALKBACK button (Fig.4, #20) is pressed and held down, the “normal” audio feeding the Booth output is overridden with audio from Mic 1 (the console operator’s mic). The booth announcer can respond by pressing the remote TALKBACK button (connected per Figure 2; see Section 2.2.1.) The announcer’s mic will be heard by the console operator via the Talkback speaker. (One-way operation is possible without using the Talkback speaker. The console operator can still speak to the booth announcer, however the booth announcer cannot reply.)

4.8 MONO OUTPUT

The ProCast includes a Mono output that provides a summed (L+R) signal of either the Program or Audition bus. The MONO OUT: PGM/AUD button (Fig.4, #21) determines which bus is sent to the Mono output. If this button is up, the Program bus fed to the Mono output; if it is down, the Audition bus is fed to the Mono output. The Mono output is always at the same level at the Program and Audition bus outputs.

4.9 MIX-MINUS OUTPUT

The Mix-Minus output of the ProCast is a monaural mix of all sources assigned to the Program bus, *except for Line channel #4.* This input should be used for the “Receive” (caller) audio from a telephone hybrid. The Mix-Minus output is therefore the same as the Program mix, minus the caller. This Mix-Minus signal is normally fed back into the hybrid’s “Send” input.

4.10 VU METERS

The ProCast features accurate VU meters (Fig.4, #23) to monitor the main bus output levels. Either the Program bus or the Audition bus can be metered by using the VU METER: PGM/AUD button (Fig.4, #22). If the button is up, the Program bus is metered. If it is down, the Audition bus is metered. Mix levels should be adjusted so most peaks read about 0VU. The meters are calibrated so that 0VU equals +4dBm on the main bus outputs.

5.0 SPECIFICATIONS*

5.1 AUDIO INPUTS & OUTPUTS

MIC inputs:	-60dBm to –40dBm, 10k Ω, balanced
MIC Process:	Post-preamp loop-thru: -10dBm, unbalanced
LINE inputs:	-10dBv or +4dBm, 5k Ω, balanced or unbalanced
AIR input:	-10dBv or +4dBm, 10k Ω, balanced or unbalanced
MAIN outputs:	+4dBm, balanced. 600 Ω load. Max output: +24dBm (6x)
MONITOR output:	-10dBm nom, unbalanced. 600 Ω load. Max output: +20dBm
BOOTH output:	-6dBm nom, unbalanced. 300 Ω load. Max output: +20dBm
PHONES output:	-6dBm nom, unbalanced. 300 Ω load. Max output: +20dBm
CUE/TB outputs:	-10dBm, unbalanced. 5k Ω load. Max output: +10dBm

5.2 AUDIO PERFORMANCE

Frequency response:	20Hz-15kHz, +/- 0.5dB
Mic channel EIN:	-125dBm, 75dB S/N with 50dB preamp gain typical.
Output noise:	75dB below nom output level, 1 Mic channel on. 80dB below nom output level, 1 Line channel on.
Distortion:	.02 % THD, IM at nom output level; ,01% at max level
Input headroom:	30dB (pre fader)
Output headroom:	20dB (post fader)
Crosstalk:	65dB @ 1kHz

5.3 POWER REQUIREMENTS

AC input:	105 to 250 VAC, 11 Watts
Power supply:	Supplied switching supply
Ground:	Chassis connected to audio ground
Approvals:	UL, TUV/IEC, CSA

5.4 PHYSICAL

Size:	18'W x 10.5"D x 4"H
Weight:	10 lbs
Misc:	Supplied with wood side panels. Rack mount adaptors optional. **

*Specifications subject to change without notice.

** Contact Sales at Harris Broadcast Division by calling 1-800-622-0022.

Warranty

The ProCast console comes with a one year warranty, covering parts and labor, from date of purchase.

For service, please contact:
Henry Engineering
503 Key Vista Drive
Sierra Madre, CA 91024
Phone: 1-626-355-3656
Fax: 1-626-355-0077

FIGURE 1