STAC (STUDIO TELEPHONE ACCESS CENTER)

TABLE OF CONTENTS

About Comrex

Comrex has been building reliable, high quality broadcast equipment since 1961. Our products are used daily in every part of the world by networks, stations and program producers.

Every product we manufacture has been carefully designed to function flawlessly, under the harshest conditions, over many years of use. Each unit we ship has been individually and thoroughly tested. Most items are available off the shelf, either directly from Comrex or from our stocking dealers.

Comrex stands behind its products. We promise that if you call us for technical assistance, you will talk directly with someone who knows about the equipment and will do everything possible to help you.

Our toll free number in North America is 800-237-1776. Product information along with engineering notes and user reports are available on our website at www.comrex.com. Our email address is info@comrex.com.

Warranty and Disclaimer

All equipment manufactured by Comrex Corporation is warranted by Comrex against defects in material and workmanship for one year from the date of original purchase, as verified by the return of the Warranty Registration Card. During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you obtain return authorization from Comrex and return the product, shipping prepaid, to Comrex Corporation, 19 Pine Road, Devens, MA 01434 USA. For return authorization, contact Comrex at 978-784-1776 or fax 978-784-1717.

This Warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification performed by anyone other than Comrex Corporation.

With the exception of the warranties set forth above, Comrex Corporation makes no other warranties, expressed or implied or statutory, including but not limited to warranties of merchantability and fitness for a particular purpose, which are hereby expressly disclaimed. In no event shall Comrex Corporation have any liability for indirect, consequential or punitive damages resulting from the use of this product.

Copyright Notice

The Comrex proprietary code and licensed, third party proprietary code residing in and otherwise associated with this product are protected by copyright law and international treaties. Unauthorized reproduction or distribution of this product, or any portion of it, may result in civil and criminal sanctions, and will be prosecuted to the fullest extent of the law.

US Government Restricted Rights - Use, duplication, or disclosure by the US Government is subject to restrictions set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS (48 CFR) 252.227-7013 or subparagraphs (c)(1) and (2) of the Commercial Computer Software-Restricted Rights clause at FAR (48 CFR) 52.227-19, as applicable.

STAC contains Macromedia® Flash™ technology by Macromedia, Inc. Copyright ©1995-2003 Macromedia, Inc. All rights reserved. Macromedia, Flash, Macromedia Flash, and Macromedia Flash Lite are trademarks or registered trademarks of Macromedia, Inc. in the United States and other countries.

This document is the End User License Agreement for the Macromedia Flash Player embedded into the STAC firmware. This player is required for implementation of "Console STAC IP" as outlined in this manual on page 25.

If you cannot agree to the terms of this EULA, please notify Comrex and we will provide firmware that removes this function.

END USER LICENSE AGREEMENT
(UNITED STATES OF AMERICA)
NOTICE TO ALL USERS: PLEASE READ THE FOLLOWING LEGAL AGREEMENT ("AGREEMENT") CAREFULLY, FOR THE LICENSE OF THE VERIFIED PORTED PLAYER ("PLAYER") PRODUCED BY MACROMEDIA, INC. ("MACROMEDIA") AND LICENSED BY AND THROUGH VIBREN TECHNOLOGIES, INC. ("LICENSOR"). BY USE OF THE EQUIPMENT UTILIZING THIS EMBEDDED SOFTWARE, YOU AND YOUR COMPANY ("YOU") CONSENT TO BE BOUND BY AND BECOME A PARTY TO THIS AGREEMENT. IF YOU ARE AN EMPLOYEE OR AGENT OF A COMPANY AND YOU ARE ORDERING ITEMS FOR USE BY SUCH COMPANY AND ITS EMPLOYEES, YOU HEREBY ACKNOWLEDGE THAT YOU ARE AGREEING TO THIS AGREEMENT ON BEHALF OF SUCH COMPANY, THAT YOU HAVE THE AUTHORITY TO BIND SUCH COMPANY TO THIS AGREEMENT AND THAT SUCH COMPANY WILL BE BOUND BY THIS AGREEMENT. IF YOU DO NOT AGREE TO ALL OF THE TERMS OF THIS AGREEMENT, RETURN THE PRODUCT UTILIZING THE EMBEDDED PLAYER TO THE MANUFACTURER.

1. License Grant. Subject to the terms and conditions of this Agreement, Licensor hereby grants to you a non-exclusive, non-transferable right to use one (1) copy of the specified version of the Player and the accompanying documentation (the "Documentation") You may utilize one (1) copy of the Player on one of the provided devices.

Use. The Player is licensed as a single product; it may not be used on more than one (1) Device, except as set forth in this Section 1.

2. Term, Renewal, Cancellation and Termination Charges. Term and Termination. This Agreement is effective time the product is utilized unless and until earlier terminated as set forth in this Agreement. Licensor may terminate this Agreement, effective immediately and automatically, if you breach any provision of this Agreement and do not cure such breach within five (5) days after receiving written notice thereof from Licensor. Upon any termination or expiration of this Agreement, you must cease use of the Player.

4. Ownership Rights. United States copyright laws and international treaty provisions protect the Player. Licensor and its suppliers own and retain all right, title and interest in and to the Player, including all copyrights, patents, trade secret

rights, trademarks and other intellectual property rights therein. Your possession, installation, or use of the Player does not transfer to you any title to the intellectual property in the Player, and you will not acquire any rights to the Player except as expressly set forth in this Agreement. Licensor reserves the right to disclose you as a customer of our product; Licensor will obtain your approval before disclosing any additional information regarding your organization's use of Licensor products in marketing or promotional materials. All copies of the Player and Documentation made hereunder must contain the same proprietary notices that appear on and in the Player and Documentation.

5. Restrictions. You may not sell, lease, license, rent, loan or otherwise transfer, with or without consideration, the Player except in the instance that you sell, lease, rent, loan or otherwise transfer the entire device utilizing the player. You shall not disclose the results of any benchmark test that you make of the Player to any third parties without Licensor's prior written consent. You agree not to permit any third party to use the Player in any form and shall use all reasonable efforts to ensure that no improper or unauthorized use of the Player is made. You may not permit third parties to benefit from the use or functionality of the Player via a timesharing, service bureau or other arrangement. You may not transfer any of the rights granted to you under this Agreement. You may not reverse engineer, decompile, disassemble the Player, or otherwise reduce the software for the Player to a human-readable form. You may not modify or create derivative works based upon, the Player in whole or in part. You may not copy the Player or Documentation except as expressly permitted in Section 1 above. You may not remove any proprietary notices or labels on the Player. All rights not expressly set forth hereunder are reserved by Macromedia and/or Licensor.

6. Warranty Disclaimer. THE PLAYER IS PROVIDED "AS IS." TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, LICENSOR DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NONINFRINGEMENT WITH RESPECT TO THE PLAYER AND THE ACCOMPANYING DOCUMENTATION. YOU ASSUME RESPONSIBILITY FOR SELECTING THE PLAYER TO ACHIEVE YOUR INTENDED RESULTS, AND USE OF, AND RESULTS OBTAINED FROM THE PLAYER. WITHOUT LIMITING THE FOREGOING PROVISION, LICENSOR MAKES NO WARRANTY THAT THE PLAYER WILL BE ERROR-FREE OR FREE FROM INTERRUPTIONS OR OTHER FAILURES OR THAT THE PLAYER WILL MEET YOUR REQUIREMENTS. The foregoing provision shall be enforceable to the maximum extent permitted by applicable law.

7. Limitation of Liability. UNDER NO CIRCUMSTANCES AND UNDER NO LEGAL THEORY, WHETHER IN TORT, CONTRACT, OR OTHERWISE, SHALL LICENSOR OR ITS SUPPLIERS BE LIABLE TO YOU OR ANY THIRD PARTY FOR ANY DIRECT, INDIRECT, SPECIAL INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF GOODWILL, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, OR FOR ANY AND ALL OTHER DAMAGES OR LOSSES. IN NO EVENT WILL LICENSOR OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES IN EXCESS OF THE LIST PRICE LICENSOR CHARGES FOR A LICENSE TO THE PLAYER, EVEN IF LICENSOR SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION OF LIABILITY SHALL NOT APPLY TO LIABILITY FOR DEATH OR PERSONAL INJURY TO THE EXTENT THAT APPLICABLE LAW PROHIBITS SUCH LIMITATION. The foregoing provision shall be enforceable to the maximum extent permitted by applicable law.

8. Export Controls. You shall not acquire, ship, transport, export or re-export the Player, directly or indirectly, into any country in violation of any applicable law (including, but not limited to, the United States Export Administration Act and the regulations promulgated there under) nor will you use the Player for any purpose prohibited by such laws.

9. High Risk Activities. The Player is not fault-tolerant and is not designed or intended for use in hazardous environments requiring fail-safe performance, including without limitation, in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, weapons systems, direct life-support machines, or any other application in which the failure of the Player could lead directly to death, personal injury, or severe physical or property damage (collectively, "High Risk Activities"). Licensor expressly disclaims any express or implied warranty of fitness for High Risk Activities.

10. Miscellaneous. This Agreement is governed by the laws of the United States and the Commonwealth of Massachusetts, without reference to conflict of laws principles. The application of the United Nations Convention of Contracts for the International Sale of Goods is expressly excluded. This Agreement sets forth all rights for the user of the Player and is the entire agreement between the parties. This Agreement supersedes any other communications with respect to the Player and Documentation. This Agreement may not be modified except by a written addendum issued by a duly authorized representative of Licensor. No provision hereof shall be deemed waived unless such waiver shall be in writing and signed by Licensor or a duly authorized representative of Licensor. If any provision of this Agreement is held invalid, the remainder of this Agreement shall continue in full force and effect.

11. LICENSOR CUSTOMER CONTACT. If you have any questions concerning these terms and conditions, or if you would like to contact Licensor for any other reason, please contact your sales representative.

IN WITNESS WHEREOF, each of the parties has caused this Agreement to be executed as an instrument under seal as of the day and year first above written.

SECTION **1**   INTRODUCTION

STAC Features

Comrex STAC (Studio Telephone Access Center) is a multiline On Air telephone system, available for six lines (STAC6) or twelve lines (STAC12). Both versions offer the following features:

• Intuitive, attractive control surfaces with built-in handsets for call screening.

• Mainframe containing two state-of-the-art digital telephone hybrids for natural sounding caller audio.

• Control surfaces, up to four per system, configurable for *Screener* or *Studio* functions.

• All telco and control surface connections via UTP cable and RJ-45 connectors.

• Self-powered control surfaces.

• Telephone line *Loop-Thru* access.

• Auto-answer and auto-disconnect of phone lines.

• *Auto Attendant* answers lines and plays your pre-recorded message to caller.

• STAC IP allows mainframe to be used as server for remote control functions.

• STAC IP delivers web page for remote control.

What Comes With STAC

The following items are shipped with a new STAC System:

(1) STAC mainframe with one or two six-line telco cards*
(1) STAC control surface (with sidecar for twelve-line operation)
(1) AC power cord for mainframe
(1) RJ-45 cable for control surface
(1) Operating manual
(1) Warranty card (Please fill out and return.)

*The STAC system is delivered as a six or twelve-line model. A six-line STAC (STAC6) can be upgraded to a twelve-line STAC (STAC12) with one additional telco board and a sidecar for the control surface to allow line control for six more lines.

SECTION 2   MAINFRAME DIAGRAMS AND INSTALLATION

REAR PANEL DIAGRAM AND DESCRIPTIONS
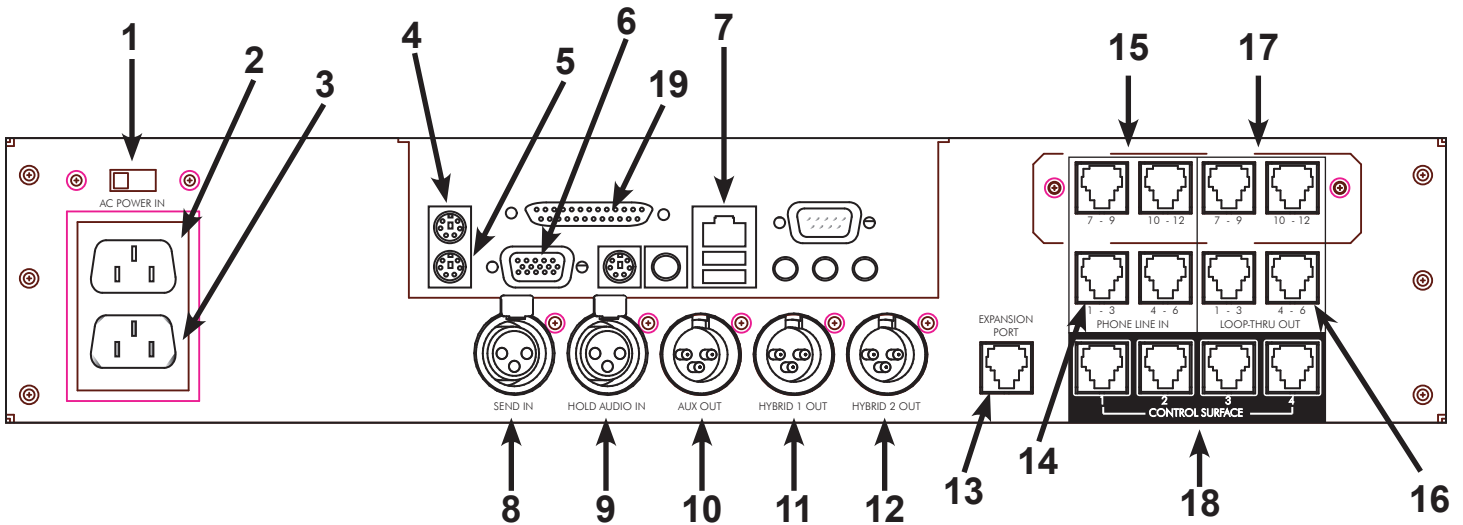
1) *AC POWER SELECT SWITCH*   This switch is used to select whether the unit will be powered by 115VAC or 230VAC.

2) *AC INPUT*   This is an IEC connector for the main power. STAC works on worldwide AC power at 115VAC or 230VAC.

3) *AC OUTPUT*   This is an IEC style power port for optional computer monitor.

4) *MOUSE PORT*   This port is used for connecting a PS/2 style mouse (if desired).

5) *KEYBOARD PORT*   This port is used for connecting a PS/2 style keyboard (if desired).

6) *VGA OUTPUT PORT*   This VGA style port is used for connecting a computer monitor.

7) *NETWORK ACCESS PORT*   This RJ-45 jack provides an Ethernet connection to serve STAC IP.

8) *SEND IN CONNECTOR*   This is a balanced female XLR connector designed to accept either line or microphone level audio, selectable via DIP switch. (See the *DIP SWITCH* section on page 12.) The audio present here will be sent to callers when they are *On Air*.

9) *ON HOLD CONNECTOR*   This 3-pin female XLR connector is designed to accept balanced, line level audio. This is the audio which callers will hear when placed *On Hold*.

10) *AUX OUT CONNECTOR*   This balanced 3-pin male XLR connector contains a mix of Hybrid 1 and Hybrid 2 audio. Send audio may also be added to this output, selectable via DIP switch. (See the *DIP SWITCH* section on page 12.)

11) HYBRID 1 OUTPUT CONNECTOR	This is a 3-pin male XLR connector with balanced line level output containing the audio of the caller(s) on Hybrid 1.
12) HYBRID 2 OUTPUT CONNECTOR	This is a 3-pin male XLR connector with balanced line level output containing the audio of the caller(s) on Hybrid 2.
13) HYBRID EXPANSION PORT	Use this RJ-45 jack to connect an external hybrid to STAC. Refer to pages 44 & 53-57 for additional information.
14) PHONE LINES 1-6 *15) PHONE LINES 7-12*	These four RJ-45 jacks provide connection of telephone lines 1-6 and 7-12 to the mainframe. See the *PHONE LINE PINOUTS* section on page 10 for wiring instructions.
16) LOOP-THRU 1-6 *17) LOOP-THRU 7-12*	These four RJ-45 jacks provide optional **Loop-Thru** connections for telephone lines 1-6 and 7-12, allowing access to designated telephone lines when STAC is not using them. STAC can also be configured via DIP switches to disable line access when a **Loop-Thru** device is active on that line. Refer to the *DIP SWITCH* section on page 12 for details.

Note: A STAC6 System only has phone line and loop-thru functions for lines 1-6. |
| *18) CONTROL SURFACE JACKS* | Use these RJ-45 jacks to connect up to four control surfaces to the mainframe with standard four-pair cable (Cat-4 or better). |
| *19) PARALLEL PORT* | This port provides status indications for *Ringing* and *On Air* lines. For details see *STAC MAINFRAME STATUS INDICATIONS* on page 14. |
| *PHONE LINE CONNECTIONS* | **Phone Line** and **Loop-Thru** connections are made via RJ-45 cables, pinned such that each phone line is on one twisted pair of a four-pair cable (Cat-4 or better) as shown on page 10. Only three pairs are used on each jack. (Pair 4 is unconnected.) The use of the **Loop-Thru** connections is optional. If used, the **Loop-Thru** connections will provide access to each designated telephone line when STAC is not using it. Also, STAC can be set to disable line access when a **Loop-Thru** device is active on that line. (See page 13 for more information.)

Comrex sells a "STAC Breakout Box Kit" that provides RJ-11 access to each phone line and **Loop-Thru** port on STAC. One kit is required for access to six telephone lines. If **Loop-Thru** access is required, two kits are required for each group of six phone lines. |

9

RJ-45 JACK
EIA/TIA 568B STANDARD
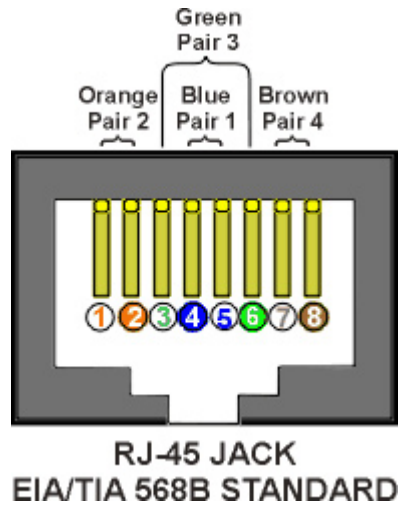
PHONE LINE PINOUTS

Phone connections require one pair of wires for each line. They are typically designated *Tip* (or Red) and *Ring* (or Green). Table 1 shows the exact pinout of the jacks. Note that pinout is identical on the **Phone Line** jacks and the **Loop-Thru** Jacks.

Table 1 - Phone Line Pinout

RJ-45 Pin Number	Line Number	Tip/Ring
1	2/5/8/11	Tip
2	2/5/8/11	Ring
3	3/6/9/12	Tip
4	1/4/7/10	Tip
5	1/4/7/10	Ring
6	3/6/9/12	Ring
7	Unused	
8	Unused	

XLR PINOUTS

STAC audio connections are balanced professional level inputs and outputs. All XLRs are pinned as follows:

Table 2 - XLR Pinout

Pin 1	Ground
Pin 2	Audio +
Pin 3	Audio -

FRONT PANEL DIAGRAM AND DESCRIPTIONS
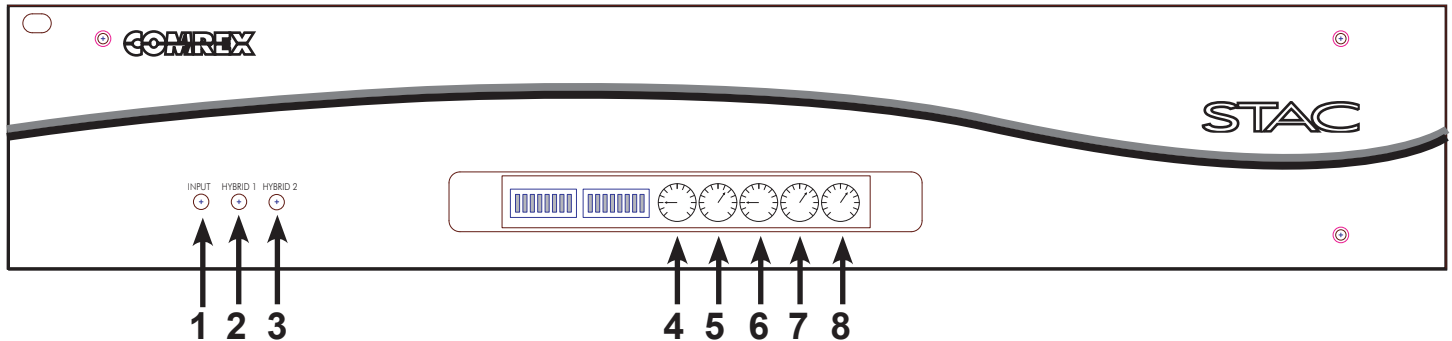
1) INPUT INDICATOR	This indicates the **Send Input** level, or the level of audio sent to callers when *On Air*. This indicator should be green during typical audio. It will light amber when the system is approaching its limit and red when the system is clipping.
2) HYBRID 1 INDICATOR	This indicates the incoming level of the call(s) on Hybrid 1. This indicator should be green during typical audio. It will light amber when the system is approaching its limit and red when the system is clipping.
3) HYBRID 2 INDICATOR	This indicates the incoming level of the call(s) on Hybrid 2. This indicator should be green during typical audio. It will light amber when the system is approaching its limit and red when the system is clipping.
4) SEND LEVEL ADJUST	Use this control to adjust the audio level sent to the caller. The **Input Indicator** (1) should be used to make this adjustment.
5) ON HOLD SEND AUDIO ADJUST	Use this control to adjust the audio sent to the callers when they are *On Hold.* This adjustment should be made with program audio being sent into the **Hold Audio** input. To make the adjustment, place a call into the system (using an external telephone) and put the call *On Hold*. Adjust this level for a good sounding signal on the telephone.
6) AUX OUT RECEIVE AUDIO ADJUST	Use this control to match the **Aux Out** level to that of your console or recorder.
7) HYBRID 1 OUT ADJUSTMENT	Use this control to match the **Hybrid 1 Out** level to match that of your console or recorder. Note this adjusts level of the output stage only (i.e. this does not boost the caller level into the hybrid).
8) HYBRID 2 OUT ADJUSTMENT	Use this control to match the **Hybrid 2 Out** level to match that of your console or recorder. Note this adjusts level of the output stage only (i.e. this does not boost the caller level into the hybrid).

DIP Switches

1 - 8

9 - 16

(Note: The *UP* position = *ON*)
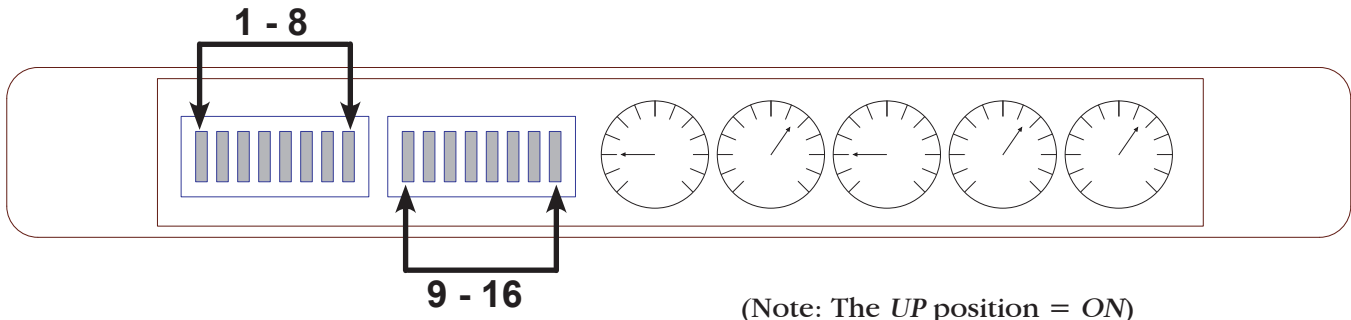
1) On Air Send Input Level
ON = Microphone level send input (–70 to –50 dBu)
OFF = Line level send input (–10 to +10 dBu)
Note: This switch only affects the On Air **Send Input**. *The* **Hold Audio Input** *is always line level.*

2) Caller Boost
ON = Add 6 dB gain to the incoming phone lines. Useful in situations with exceptionally low incoming phone line level.

3) Aux Mix
ON = Add **On Air Send** audio to the **Aux Out** output.
OFF = Only Hybrid 1 and Hybrid 2 receive audio are present at the **Aux Out** output.

4) Burst Adapt
ON = A short noise burst is sent down each line when it is put *On Air*. This helps the hybrids to adapt more quickly but can be distracting to callers.
OFF = No noise burst is sent, but a short alert tone is sent to notify callers they are *On Air*.

5 & 6) Caller "Ducking" Control
These switches control whether any caller suppression is applied. Caller suppression allows the send audio input (for instance, a talk-show host) to dynamically control the level of the incoming caller audio. This not only enhances the perceived trans-hybrid loss of STAC but also allows the studio host to control the conversation, since he or she can more easily "talk over" the callers. When **DIP Switch 5** is *ON,* 6 dB of caller control is applied on the presence of host audio. When **DIP Switch 6** is *ON*, 12 dB is applied. When both **DIP Switches 5 & 6** are *ON*, a very aggressive 18 dB of caller suppression is applied.

7) AGC
ON = STAC will dynamically adjust the level of incoming caller audio to provide more uniform level output on the incoming caller audio.
OFF = No AGC is applied to the incoming caller audio.

8) AUTO MIX-MINUS   See the *AUTOMATIC MIX-MINUS* section on page 39 for a description of this function. Most applications should leave this switch set *OFF*.

9) VIP/HOTLINE MODE   *ON* = *VIP/Hotline Mode* enabled. In this mode, the system's last two phone lines (lines 5-6 on STAC6 or lines 11-12 on STAC12) are treated separately for talk show guests or studio hotline functions. These lines are removed from the *Priority Queue*, and *Auto Attendant* will not answer these lines. *OFF* = All lines will participate in the *Priority Queue* and *Auto Attendant* functions (if enabled).

10) AUTO ATTENDANT 2/6 RINGS   *ON* = *Auto Attendant* will answer incoming calls on the sixth ring.
OFF = *Auto Attendant* will answer incoming calls on the second ring.

11) LOOP-THRU SENSE DISABLE   *ON* = *Loop-Thru* sensing is ignored.
OFF = *Loop-Thru* sensing is enabled. When enabled, this function disables access to phone lines that have been picked up downstream of STAC. "Downstream" devices are those connected via the telephone line **Loop-Thru** ports on STAC. When this function is enabled, a downstream device going off-hook will be indicated by a special light sequence on the control surfaces, and those lines will be disabled on STAC until the downstream device goes on-hook.

*Note: When the STAC has taken a line "off hook", it is always disabled at the **Loop-Thru** jack.*

12) AUTO DISCONNECT DISABLE   *ON* = Lines must be dropped manually by control surfaces or STAC IP.
OFF = Lines will drop on sensing of momentary break in battery voltage (calling party disconnect signal).

13) AUTO ATTENDANT GLOBAL DISABLE   *ON* = Disable *Auto Attendant* regardless of control surface settings.
OFF = Control surfaces determine *Auto Attendant* function.

14) SPLIT STUDIO MODE   *ON* = Changes the Hybrid call assignment sequence required for *Split Studio Mode*. See page 57 for details.
OFF = Default Hybrid call assignment of 1-2-2-1.

15 & 16) FUTURE   For future use.

The STAC mainframe provides status indications via the DB-25 parallel port on the rear panel. This is essentially a computer printer port, so it is only capable of sending TTL level status signals and cannot source or sink significant current. An accessory box is available to convert these signals to relay-based contact closures, capable of switching high voltages and currents directly.

The interface box we tested is model CK1601 available from Carl's Electronics at **http://www.electronickits.com - +1 978-422-5142**. This device provides normally-open and normally-closed contacts for each of the eight signals available on the parallel port.

Note: The CK1601 is a "build it yourself" kit and will require soldering. It is not supplied with a 12V power supply or straight-through DB-25 cable, both of which are available at electronic retailers like Radio Shack.

At this time, two signals are available on the parallel port of the STAC mainframe (using firmware 1.2 or higher):

Table 3 - Parallel Port Pinout

Pin #	Name	Description
2	Line Ringing (Active High)	Goes Active when any line is *Ringing*
3	Record Trigger (Active High)	Goes Active when any line is put *On Air*

Ground is available on Pins 18-25 of this connector.

SECTION 3   CONTROL SURFACE DIAGRAMS AND INSTALLATION

BASICS   STAC is delivered with one control surface. Four ports are present on the
                            STAC mainframe, so up to four control surfaces may be used. Additional
                            control surfaces are available from Comrex. Each control surface contains
                            one telephone handset, useful for screening or dialing calls. The control
                            surfaces require Cat-4 (or better) wiring with Ethernet style pinning, using
                            all four pair on the RJ-45 cable. Avoid underpinned and cross-over cables.
                            The control surfaces are powered over this cable and can be extended to
                            100 feet.

                            Before setting up a control surface for use with STAC, you must determine
                            whether the surface will be used as a *Screener* or a *Studio* surface. The ma-
                            jor differences are listed below:

                                1) Only *Studio* control surfaces can put calls *On Air*.
                                2) Only *Studio* control surfaces provide indication of which hybrid is
                                being used for each call.
                                3) *Studio* control surfaces share a single button for *Answer* and *On
                                Hold*.
                                4) *Screener* surfaces have separate buttons for *Answer* and *On Hold*.
                                5) *Studio* and *Screener* surfaces have different color lights to indicate
                                the various states of each phone line.

                            If you plan on using only one control surface (without STAC IP), you must
                            configure the surface for *Studio*, since this will be the only way to put calls
                            On Air. *Studio* surfaces can perform all functions of *Screener* surfaces.

TOP VIEW DIAGRAM AND DESCRIPTIONS
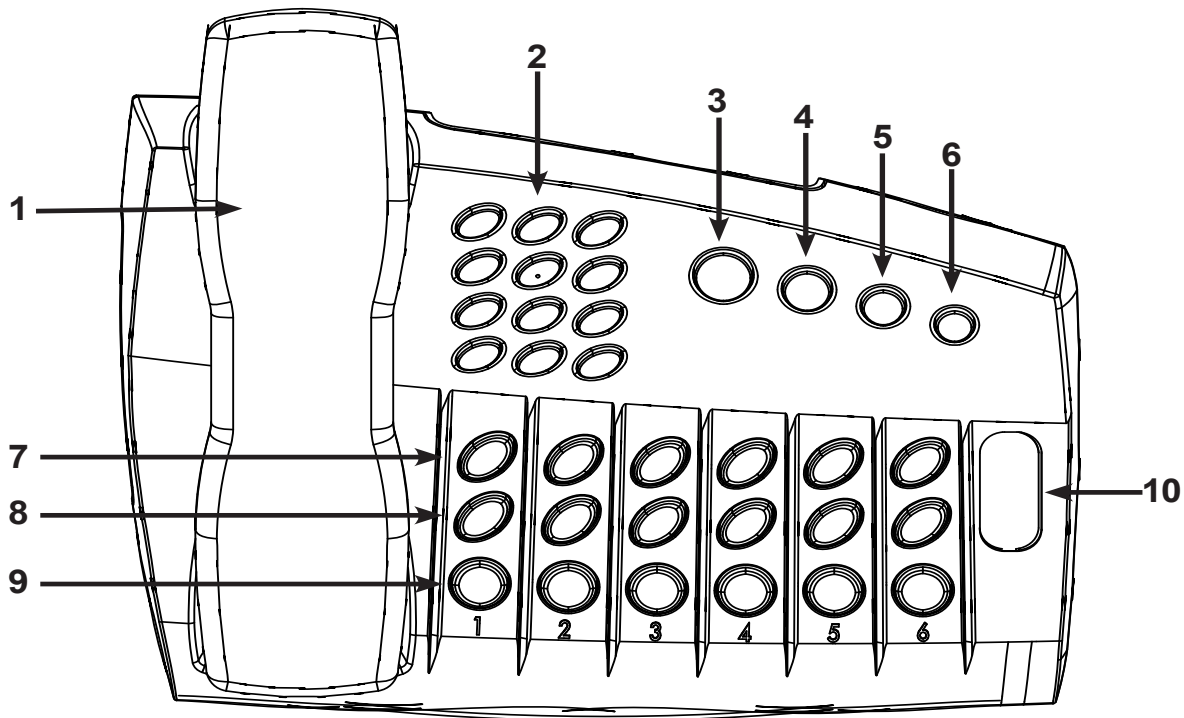
1) HANDSET	Used to screen incoming calls and to make outgoing calls.
2) DIAL PAD	Used to send touch tone dialing to the phone line selected.
3) AUX/NEXT	Depending on DIP switch settings, can be used to trigger an external device via contact closure (*Aux* function) or to select the next call to put *On Air* (Next Function). Function selected via DIP switch. (See *MORE ABOUT THE AUX/NEXT BUTTON AND CONTACT CLOSURES* section, page 19.)
4) BUSY ALL	Used to take all lines *Off Hook* before contests.
5) CHANGE PRIORITY	Used to change which line is currently set as the *Priority* line (Next to air).
6) AUTO ATTENDANT	Used to enable/disable the *Auto Attendant* function. (See page 23.)
7) ANSWER (ANSWER/HOLD)	These buttons are used to pick up lines and route them to the handset. In *Studio* mode, this button is also used to put lines *On Hold*.
8) HOLD (ON AIR)	When configured as a *Screener* surface, this button puts the selected line *On Hold*. When configured as a *Studio* surface, this button puts the selected line *On Air*.
9) DROP	Hangs up selected line, whether it is on the handset, *On Hold* or *On Air*.
10) LEGEND	This label defines the button functions for the *Studio* and *Screener* modes.

16

REAR VIEW DIAGRAM AND DESCRIPTIONS
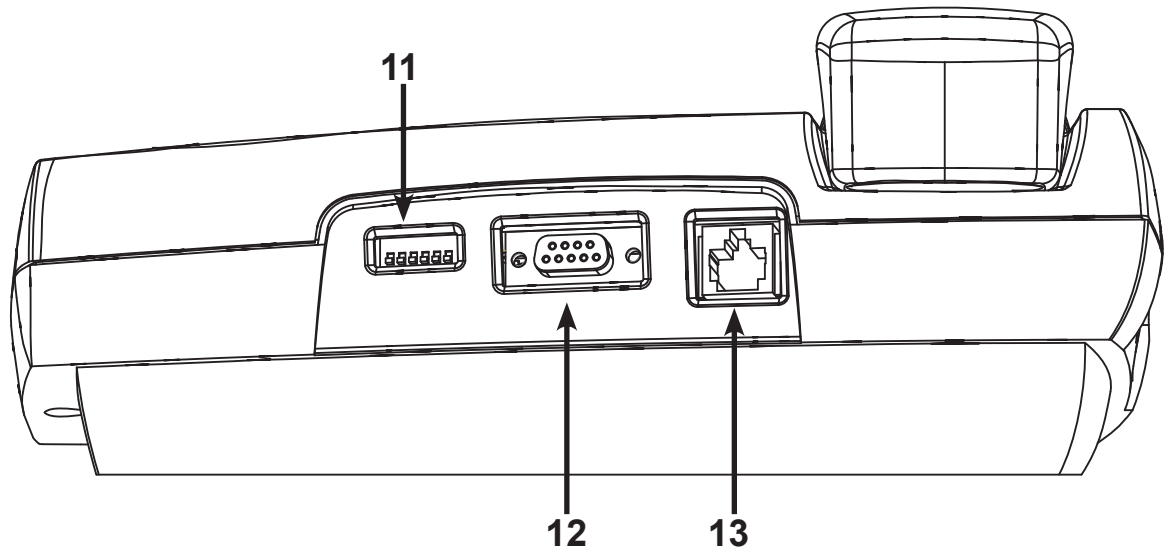
11) DIP SWITCHES (6)	These switches determine the configuration of the STAC control surface. See *CONFIGURATION* on page 18 for further details.
12) DB-9 CONNECTOR	A contact closure (configurable via the control surface **DIP Switches**) is available on Pins 7 & 8, useful for controlling a profanity delay or recorder.
13) CONNECTION TO MAINFRAME	This RJ-45 connector requires a UTP type cable to connect to one of the four STAC mainframe control ports.

SIDE VIEW DIAGRAM AND DESCRIPTIONS
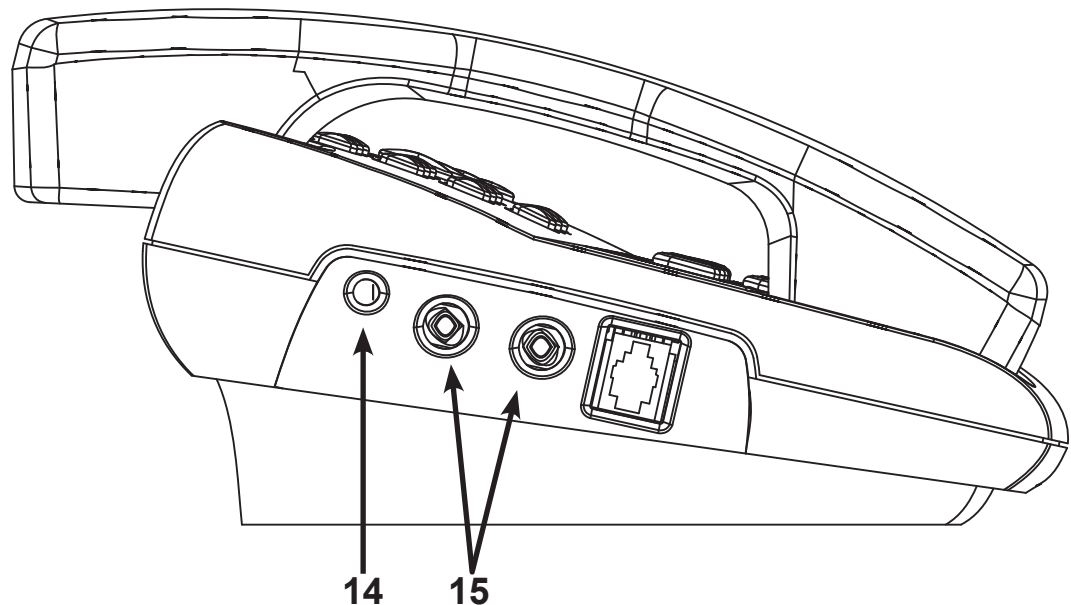
14) VOLUME ADJUSTMENT	Used to adjust headset volume (does not affect handset volume).
15) HEADSET CONNECTORS (MIC/HEADPHONE)	Two 1/8" jacks for connection of a PC soundcard-compatible headset for call screening.

CONFIGURATION

The STAC control surface is configured via six **DIP Switches** on the rear panel (shown as #11 of the *REAR VIEW* diagram on page 17). Each control surface connected to STAC may be configured independently. The **DIP Switches** are considered *ON* when they are in the *UP* position (i.e. the actuator points toward the top of the surface).

DIP SWITCH SETTINGS

The **DIP Switches** have the following functions:

1) SCREENER/STUDIO SURFACE

ON = Screener surface.
OFF = Studio surface.
STAC control surfaces are provided with a removable and reversible legend that shows the functions of the line buttons in each of the two available modes. Make sure the legend follows the setting for **DIP Switch 1**.

2 & 3) AUX/NEXT BUTTON & CONTACT CLOSURES

Configure **Aux/Next** Button and **DB-9 Contact Closure** pins on control surface.

Note: For a full description of the Next and Aux functions and Contact Closures, see page 19.

4) FUTURE

For future use.

5) HEADSET/HANDSET MODE

ON = Handset operates normally.
OFF = Headset plugged in to control surface. (Lines can be answered in this mode without lifting the handset.)

6) HANDSET BOOST

ON = Handset audio level normal.
OFF = Handset audio increased by 6 dB (for hearing impaired).

Note: The default settings for a control surface (as shipped from the factory) are DIP Switches 1,2,3 OFF and DIP Switches 5,6 ON.

MORE ABOUT THE AUX/NEXT BUTTON AND CONTACT CLOSURES

The **Aux**/**Next** button has several functions which are controlled by the settings of **DIP Switches 2 & 3** on the control surface. The configuration of these **DIP Switches** also alters the *Contact Closure* function (available on **Pins 7 & 8** of the control surface DB-9 connector).

Essentially, the button can trigger the contact closure directly (*Aux Mode*) either in momentary or latching fashion. Alternatively, the button can put the priority line to air (*Next Mode*).

Note: You cannot manually control the contact closure while using the Next Mode.

While in *Next Mode*, the contact closure on the control surface works differently. It provides a status indication that can be configured to close when any line is *On Air* (Record trigger) or when any line is *Ringing* (Line Ringing Indicator).

Table 4 on page 20 shows the **DIP Switch** configuration for each mode. **DIP Switches** are *ON* when they are up (actuator points to the top of the control surface).

Table 4 - Contact Closure and Aux/Next DIP Switch Settings

Dip Switch 2	Dip Switch 3	Contact Closure and Aux/Next Function
On	On	**Latching Manual Closure** Defaults to *Open*. Toggles between *Closed* and *Open* when **Aux**/**Next** button is pressed. (Button has no effect on line status.)
On	Off	**Momentary Manual Closure** Closed when **Aux**/**Next** button is pressed. Open when **Aux**/**Next** button is released. (Button has no effect on line status.)
Off	Off	**Record Trigger** Closed when any lines *On Air*. Open when no lines *On Air*. **Aux**/**Next** button acts as *Next* function. (Puts *Priority* line to *On Air.*)
Off	On	**Line Ringing Indication** Closed when any lines are ringing. Open when no lines are ringing. **Aux**/**Next** button acts as *Next* function. (Puts *Priority* line to *On Air.*)

Note: The control surface contact closure is NOT rated for high voltages or currents. DO NOT switch AC mains power using this closure.

Note: Record Trigger and Line Ringing Indication are also available from the mainframe. See STAC MAINFRAME STATUS INDICATIONS on page 14 for details.

SECTION 4   CONTROL SURFACE OPERATION

SCREENER CONTROL SURFACE   Each of STAC's six or twelve lines can be in one of several states. Table 5 shows these states and the resulting indications:

Table 5 - Screener States/Indications

Line State	Button	Color	Cadence	Note
Idle	None	None	None	On-Hook
Loop-thru Active	Answer & Hold	Alternating	Alternating	Line disabled for use
Ringing	Answer	Green	Flashing	
On Handset	Answer	Green	Solid	Or Headset
On another Handset	Answer	Yellow	Solid	
On Hold	Hold	Blue	Solid	Caller hears Hold audio
Screened Hold	Hold	Blue	Flashing	Caller hears Hold audio
Priority Hold	Hold	Red/Blue	Alternating	Caller hears Hold audio
Busied Out	Answer & Hold	Red/Yellow	Alternating	All unlocked lines
On Air	Hold	Red	Solid	Cannot be controlled from this control surface - caller transferred to hybrid

TYPICAL SCREENER OPERATION   1) Incoming calls will flash green when ringing.
2) Greeter will answer a call by pressing the **Answer** button for that line.
3) Greeter will press **Hold** button for the line to place call on hold.
4) Screener will press **Answer** button for that line to screen the call on the handset.
5) Screener will press **Hold** button twice to put call on *Screened Hold* (or once for regular *Hold*).

STUDIO CONTROL SURFACE   Each of STAC's six or twelve lines can be in one of several states. Table 6 shows these states and the resulting indications.

Table 6 - Studio States/Indications

Line State	Button	Color	Cadence	Note
Idle	None	None	None	On-Hook
Loop-thru Active	Answer/Hold	Alternating	Alternating	Line disabled for use
Ringing	Answer/Hold	Green	Flashing	
On Handset	Answer/Hold	Green	Solid	Or Headset
On another Handset	Answer/Hold	Yellow	Solid	
On Hold	Answer/Hold	Yellow	Flashing (slow)	Caller hears Hold audio
Screened Hold	Answer/Hold	Yellow	Flashing (fast)	Caller hears Hold audio
Priority Hold	Answer/Hold	Green/Yellow	Alternating	Caller hears Hold audio
Busied Out	Answer/Hold	Red/Yellow	Alternating	All unlocked lines
On Air Hybrid 1 Unlocked	On Air	Red	Flashing	Caller audio transferred to Hybrid 1
On Air Hybrid 1 Locked	On Air	Red	Solid	Caller audio transferred to Hybrid 1
On Air Hybrid 2 Unlocked	On Air	Blue	Flashing	Caller audio transferred to Hybrid 2
On Air Hybrid 2 Locked	On Air	Blue	Solid	Caller audio transferred to Hybrid 2

TYPICAL STUDIO OPERATION   1) Incoming calls will flash green when ringing.
2) A call can be answered by pressing the **Answer/Hold** button for that line. (This can also be done on a screener surface.)
3) Calls can be put on hold by pressing the **Answer/Hold** button for that line. (This can be done on a screener surface.)
4) The line that has been *On Hold* the longest will flash with the priority indication on the **Answer/Hold** button.
5) Calls are placed *On Air* by pressing the **On Air** button for that line (or the **Next** button). *On Air* calls that have not been Locked will be dropped.
6) *Lock* a call *On Air* for conferencing by pressing the **On Air** button a second time.

OTHER CONTROL SURFACE
INDICATIONS

HOLD

STAC allows two different indications for calls *On Hold*. Hold status is intended to indicate that a line has been answered, but not necessarily screened. *Screened Hold* is set by pressing a line's **Hold** button a second time, and is meant to indicate that a line has been screened and is ready for *On Air*. Use of *Screened Hold* is optional.

ON AIR

STAC allows two different indications for calls *On Air*. *Unlocked* status means that the next line selected for *On Air* will drop the current line *On Air*. *Locked* lines will remain *On Air* when the next line is selected.

If a call is *Locked*, the next call selected *On Air* will be placed onto either Hybrid 1 or Hybrid 2 in the following specific order: 1-2-2-1. The only way to air more than one call at a time is to lock previous lines before transferring the new ones to *On Air*.

PRIORITY

STAC maintains a *Priority Queue* which determines which line has priority to go *On Air* next. The next line in logical queue to go *On Air* will flash with the special priority indication – red/blue alternating on a *Screener* surface and yellow/green alternating on a *Studio* surface.
   • The line on *Screened Hold* the longest will indicate as the priority line.
   • If no lines are set to *Screened Hold*, the line with the longest normal hold time will indicate priority.
   • The priority line may be changed manually by pressing the **Change Priority** button followed by the **Hold** button of the line you wish to set to priority. The current priority line will then be given second place in the *Priority Queue*.

AUTO ATTENDANT

STAC has the ability to handle incoming calls in several ways, depending on the *Auto Attendant* settings.

Auto Attendant has five possible settings:
   1) STAC does not answer incoming calls.
   2) STAC answers incoming calls after two rings and puts calls *On Hold*.
   3) STAC answers incoming calls after six rings and puts calls *On Hold*.
   4) STAC answers calls after two rings and plays a short outgoing message to the caller before putting the line *On Hold*.
   5) STAC answers calls after six rings and plays a short outgoing message to the caller before putting the line *On Hold*.

Auto Attendant is globally disabled (no calls are answered) by setting Mainframe **DIP Switch 13** to the *ON/UP* position. In the normal (*OFF/ DOWN*)position, the *Auto Attendant* configuration is controlled by the control surface(s)or by STAC IP.

The **Auto Attendant** button on the control surface or STAC IP interface is global in reach. For example, if **AA** is selected on one control surface, it is active on all. When this button is inactive, STAC will not automatically answer incoming calls. When the button is active, incoming calls will be automatically answered. The number of rings before answering is selected via the mainframe **DIP Switch 10** *(OFF/DOWN = 2 rings, ON/UP = 6 rings)*.

To select options for outgoing message, enter *AA Configuration Mode* by lifting the handset and holding down the **Auto Attendant** button on any control surface for approximately three seconds. The button will flash, and you will hear voice prompts on the handset instructing you how to record and enable outgoing messages. Up to six different 60-second outgoing messages can be recorded and selected for play. The messages will be stored in non-volatile memory and will be retained in the event of a power interruption.

If no message is selected, calls will be answered and put directly to *Hold* status. Remember, after exiting this menu you must leave the **AA** button lit to enable the *Auto Attendant* function. When **AA** is not illuminated, lines must be answered manually.

SECTION **5**   **STAC IP**

*A*BOUT *STAC IP*

STAC has the ability to provide a complete call screening server and remote control function without the need for any external hardware or software. The STAC mainframe acts as an Internet web server, delivering a web page to multiple clients using web browsers. In addition, the STAC mainframe itself can be used to access this interface. The web page allows for user entry of call screening information and can control most of the functions available from the control surfaces.

*S*ETUP

STAC IP can be accessed two ways:

1) Console STAC IP – Accessed by connecting a monitor, keyboard and mouse to the proper ports on the STAC mainframe. When STAC is booted, the STAC IP interface will appear on the display and the control functions are enabled.

2) Remote STAC IP – Accessed by pointing a browser to the STAC's IP address over a network. To set up and configure the STAC IP address, see *IP A*DDRESS *C*ONFIGURATION section below.

Console STAC IP and *Remote STAC IP* work identically and can be accessed simultaneously. Note that STAC does not provide the ability to "hot-plug" a keyboard and mouse. STAC must be rebooted after these are attached. Only PS/2 keyboard and mouse may be used.

Note: STAC only provides an analog video connection to the monitor. The monitor must allow 1024x768 video resolution. If you are having trouble seeing STAC's video output, be sure that your monitor is set to display the analog (15-pin sub D) input connection. Many new monitors default to their digital video ports.

*R*EQUIREMENTS

Remote STAC IP requires the Macromedia Flash® Plug-in 6 or greater for your browser (usually included by default). It has been tested to function correctly on Microsoft Internet Explorer® 6 and Mozilla Firefox® 1.0.

*IP A*DDRESS *C*ONFIGURATION

The STAC mainframe must be connected to your network and assigned an IP address to operate STAC IP. Connection is made via a UTP type Ethernet cable connected to the **Network** port on the rear panel. Configuration requires that a monitor and keyboard (not provided) be attached to their respective ports on the mainframe. The keyboard must be connected before the STAC mainframe is powered up.

Static vs. Dynamic IP Addressing

STAC is able to serve web pages to clients using web browsers. In order for the browsers to find STAC on your network, STAC must be assigned an IP address. This address can be a fixed static number or can be assigned dynamically by your network, if a DHCP server is present on your network. We recommend use of STAC with a fixed IP address if possible, since DHCP addresses can change over time.

Dynamic Configuration

STAC is factory-configured for dynamic IP assignment and no configuration should be necessary. The IP address assigned to STAC by the network will appear on the *Console STAC IP* interface. Simply connect a monitor to the video port on the STAC mainframe to retrieve this information.

Static Configuration

To set the STAC mainframe for *Static IP*, you must have a keyboard and monitor attached to the STAC mainframe. If a keyboard is not connected to the mainframe, a reboot will be required after it is attached.

You will need to enter *Config Mode* to change this setting:

1) Apply power to the STAC mainframe with a keyboard, monitor and mouse (optional) attached. Wait for STAC to display the STAC IP screen on the monitor.

2) Press **Control-Alt-F3** (simultaneously) on the keyboard. The STAC IP interface will be replaced by a command line login prompt.

3) At the login prompt type the word **configure**, then press **Enter.**

4) Click on **IP** with your mouse or press the **ESC+I** on the keyboard. *Note: Using the keyboard ESC + letter selects the shortcut. The **Tab** and **Arrow** keys change fields. **Enter** is used to make the selection.*

5) Select **Configure** to access the **Network Configuration** menu.

6) Change the factory default setting from *DHCP* to *Static IP.*

7) Edit the following lines with your IP configuration information:
       IP Address
       Netmask
       Gateway
       DNS Server
   Click on **OK** when finished.

8) Save your changes by clicking on **File** and **Save Configuration.**

STAC IP Network Configuration Screen

File	IP	GUI	Line

Configure

Network Configuration

Static or Dynamic Mode

(O) Static IP
(   ) DHCP

IP Address	XXXXXXX
Netmask	XXXXXXX
Gateway	XXXXXXX
DNS	XXXXXXX

OK   Cancel

ESC - letter selects shortcut, Tab and Arrow keys change fields, Enter to select

9) Exit the *Config Mode* by selecting **File** and **Exit**. You will be prompted to save your changes before exiting. Press **Control-Alt-F4** at the login prompt to return to STAC IP screen.

10) Attach the network cable to the STAC network port and reboot.

11) Key your STAC IP address into a browser connected to your network. STAC IP should appear on your display.

GAINING ACCESS

When remote STAC IP is accessed, a password screen is presented. The user may enter any **user name**, but the case-sensitive password must be the same as that programed into the STAC mainframe. (See page 34&35 for password programming information.) The default system password is **comrex** (lower case). The STAC IP chat window will notify all users of anyone logging in or out (by referencing their user name) and all "Studio Chat" text messages will be identified by the same name.

The remote STAC IP screen is designed to expand automatically to your monitor's resolution. We recommend a resolution of at least 1024x768 to view remote STAC IP. Also, the web page is best viewed in full screen mode to make the information easiest to read. **F11** toggles full screen mode on/off on most browsers.

STAC IP INTERFACE

The STAC IP interface is designed to provide almost all the functionality of a control surface with the following exceptions:

1) In order to screen calls using STAC IP, you will need to have a control surface attached to the system. Although you can answer calls using the STAC IP interface, calls will be routed to the handset (or headset) of the control surface you designate. (See *ASSOCIATING STAC IP WITH A CONTROL SURFACE* on page 33.)

2) STAC IP cannot dial outgoing calls, either in *Answer* mode or *On Air*. You must use a control surface keypad to dial outgoing calls.

The STAC IP screen is shown on page 29. *Note: The figure shown is for a STAC12 system. If you have STAC6, only six line fields will be shown.*

STAC IP Screen
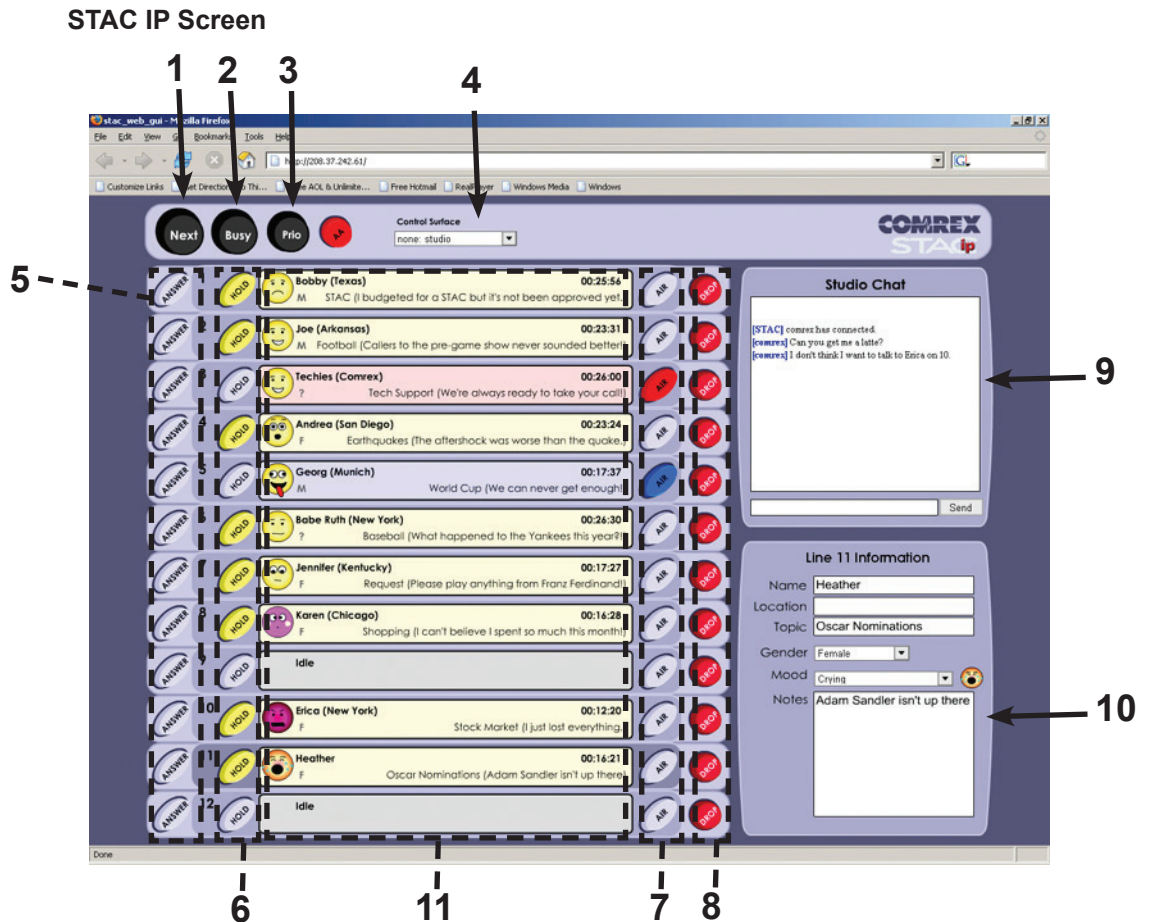
MAJOR STAC IP FUNCTIONS

Here is a description of the major STAC IP functions:

1) NEXT

Automatically puts the highest priority line *On Air*. In some circumstances this will be the only button required for On Air talent and it is also useful for contests. If the **Control Surface Select** drop down menu (4) is selected for *Screener Mode*, **Next** is disabled. See *ASSOCIATING STAC IP WITH A CONTROL SURFACE* on page 33 for more details.

2) BUSY

Takes all lines off-hook and "busies" them out. Lines remain busy until this is selected again. This is useful in clearing lines before contests. (Lines *Locked On Air* won't be dropped.)

3) PRIORITY

Allows a line to be selected as the *Priority* or *Next* line. Normally, the *Priority* line is the one that has been on hold the longest. This function allows the user to change the *Priority Queue*. Note that, on STAC IP, this function works slightly differently than on the control surfaces. Here, you must select the line you wish to "bump" to *Priority* status before pressing the **Priority** button. When assigning *Priority* on the control surface, these key presses are reversed.

4) CONTROL SURFACE SELECT	See *ASSOCIATING STAC IP WITH A CONTROL SURFACE* on page 33 for details.
5) ANSWER	Functional only after control surface association. Routes a call to the selected control surface handset.
6) HOLD	Allows a call to be put in *On Hold* status. Pressing this button on a line that is already *On Hold* will change the line to *Screened Hold* status.
7) ON AIR	Places a call on one of the internal hybrids so it can be sent to air. Pressing this button after a call is *On Air* will lock the call onto the hybrid and allow conferencing. Calls will be placed onto the internal hybrids in the following order:

> First call: Hybrid 1
> Second call: Hybrid 2
> Third call: Hybrid 2
> Fourth call: Hybrid 1

Up to two calls can be assigned to each of the internal hybrids. Note that if lines are not *Locked*, previous *On Air* lines are disconnected when a new one is chosen. If no lines are locked, all calls are routed to Hybrid 1.

*Note: The **On Air** buttons are visible, but disabled, if the STAC IP session is set for Screener or associated with a screener control surface.*

8) DROP	Disconnects selected line from the system.
9) STUDIO CHAT WINDOW	Allows text "chat" between all users of the system. Text entered into the entry field will be sent to all users when the **Send** button is pressed (or when the **Enter** key on the keyboard is pressed).
10) LINE STATUS ENTRY FIELD	When a line is selected in any way (*Answered*, put *On Hold*, or *On Air*), the data entry field for that line is activated, and the user is prompted to fill in the relevant information for the caller. Data appears in real time to all those viewing the STAC IP. Pull-down menus are available to select the gender of a caller and to associate the caller with a mood via the available "emotions". The data entry field for a particular line may also be selected by clicking on the text display for that line or by using the keyboard **up arrow** (↑) or **down arrow** (↓) to select a line.

10) LINE STATUS ENTRY FIELD (CONT.) When entering screening text information, note that there are several reserved keys which should not be used. The Macromedia Flash interface reserves **Function** keys (e.g. **F1**, **F2**, etc.) at the top of the keyboard for its own uses. Also, the "backtick" (the ` symbol, shared with the tilde ~, and usually just below **Esc**) is reserved for *Command Mode* (see page 32).

11) LINE STATUS FIELDS Display line status or screening information associated with a particular line.

BUTTON STATUS The STAC IP buttons indicate the status of each line in much the same way as the control surface. Table 7 shows the different line states and their indications:

Table 7 - STAC IP States/Indications

Line State	Button	Color	Cadence	Note
Idle	None	None	None	On-Hook. "idle" displayed in text field
Loop-thru active	None	None	None	Line disabled for use. "Line in use" displayed in text field
Ringing	Answer	Green	Flashing	"Ringing" displayed in text field
On Handset	Answer	Green	Solid	Or Headset
On another Handset	Answer	Yellow	Solid	
On Hold	Hold	Yellow	Solid	Caller hears Hold audio
Screened Hold	Hold	Yellow	Flashing	Caller hears Hold Audio
Priority Hold	Hold	Green/Yellow	Alternating	Caller hears Hold Audio
Busied Out	None	None	None	All unlocked lines display "Busied Out" in text field
On Air Unlocked	Air	Red = Hybrid 1 Blue = Hybrid 2	Flashing	Caller transferred to hybrid
On Air Locked	Air	Red = Hybrid 1 Blue = Hybrid 2	Solid	Caller transferred to hybrid

The normal mode of operation of STAC IP is referred to as *Text Entry Mode*. For users who prefer to use only a keyboard, STAC offers *Command Mode* which allows a user to press any button on the interface by entering a two or three key sequence. *Command Mode* is entered by pressing the backtick (`) key on the keyboard. This symbol is shared with the tilde (~), usually located just below the **Esc** key. After *Command Mode* is entered, the following one or two keys will determine which function is desired, after which the system will return to normal *Text Entry Mode*. *Command Mode* is indicated, when active, at the top of the STAC IP display.

INDIVIDUAL LINE COMMANDS

Functions performed on a particular line require three key presses, including the **Command Mode** key.

Once *Command Mode* is entered, press the key for the line of your choice. Lines 1-9 are accessed by pressing their corresponding numerical keys. For example, line 1 is accessed by pressing the one (**1**) key. Line 10 is selected with the zero (**0**) key, line 11 is selected with the dash (**–**) key, and line 12 by the equal (**=**) key. This is followed by a key to determine which function is to be performed. These are the function keys:

> **a** - *Answer* call
> **h** - Place call *On Hold/Screened Hold*
> **d** - *Drop* call
> **o** - Put call *On Air*/lock call *On Air*
> **p** - Change *Priority* of current line

For example, to put line 9 on *Hold*, you would type `**9h** and to *Drop* line 12, you would type `**=d**

Note that the **Answer (a)** and **On Air (o)** commands are sometimes disabled, based on whether you are working as a *Screener* or *Studio* surface. (See pages 21-22.)

GLOBAL COMMANDS

Functions that do not specify a particular line require only two key presses, including the **Command Mode** key.

These are the global commands:
> **n** - Put *Next Priority* line to air (Only if STAC IP is configured for *Studio*)
> **t** - Toggle *Auto Attendant* on/off
> **b** - Toggle *Busy Out*

For example, to *Busy Out* all lines, type `**b**

Pressing the **Tab** key anytime from *Command Mode* will abort this mode and return to *Text Entry Mode*. The cursor will be placed in the chat window.

OTHER FUNCTIONS

While in T*ext Entry Mode* in STAC IP, pressing the **Tab** key will scroll through the various text boxes.

The **Up Arrow** (↑) and **Down Arrow** (↓) keys select lines for text entry. The **Control** key will move the cursor to the chat field at any time.

ASSOCIATING STAC IP WITH A CONTROL SURFACE

It is possible to "assign" a STAC IP session, either console or remote, to a control surface port. This allows for screening of calls completely via the STAC IP system. In essence, along with all its usual functions, the STAC IP program will determine which lines get routed to the handset of a control surface. This way, a screener can simply use the handset (or a headset) connected to the control surface, and completely manage the screening session via STAC IP.

Control surface assignment is done via the pull-down menu at the top of the STAC IP screen. This menu has the following options:

Table 8 - Control Surface Assignment Menu

Option	Meaning
none:Studio (default)	No control surface association, Answer Buttons non-functional, On Air Buttons functional
none:Screener	No control surface association, Answer Buttons non-functional, On Air Buttons non-functional
1:Studio 1:Screener 2:Studio 2:Screener 3:Studio 3:Screener 4: Studio 4:Screener	Based on number of control surfaces attached (and Studio/Screener settings of each) these options will appear. Selection of one of these options will enable the Answer buttons. Answered calls will be routed to the selected control surface handset (or headset). On Air buttons are enabled only if the associated control surface is set for Studio mode.

Use of a PC-compatible headset along with a control surface enables STAC IP to function very similar to a "call center", where calls can be selected and screened and text can be input – all from the computer interface.

CHANGING THE STAC IP PASSWORD

To change the STAC IP password, you must have a PS/2 keyboard and monitor attached to the STAC mainframe. If a keyboard is not connected to the mainframe, a reboot will be required after it is attached. You will need to enter *Config Mode* to change this setting. Here's how:

1) Apply power to the STAC mainframe with a keyboard, monitor and mouse (optional) attached. Wait for STAC to display the STAC IP interface screen on the monitor.

2) Press **Control-Alt-F3** (simultaneously) on the keyboard. The STAC IP interface screen will be replaced by a command line login prompt.

3) Login by typing **configure** and press **Enter**.

4) Click on **GUI** with your mouse or press the **ESC+G** on the keyboard. *Note: When using the keyboard, **ESC** + **letter** selects the shortcut. The **Tab and Arrow** keys change fields. **Enter** is used to make the selection.*

STAC IP GUI Configuration Screen

File	IP	GUI	Line

Configure

GUI Configuration

GUI Password   comrex

OK   Cancel

ESC - letter selects shortcut, Tab and Arrow keys change fields, Enter to select

5) Select **Configure** to access the **GUI Configuration** menu. (The line will display the current password if it has been changed from the default.)

6) Replace the word **comrex** (or the current password) with the new password of your choice. Note that the password is case sensitive.

7) Save your changes by clicking on **File** and **Save Configuration**.

8) Exit the *Config Mode* by selecting **File** and **Exit**. You will be prompted to save your changes before exiting. Press **Control-Alt-F4** at the login prompt to return to STAC IP screen.

9) Recycle power to STAC. The new STAC IP password should be active.

TROUBLESHOOTING REMOTE STAC IP

If you are unable to access STAC IP from a remote computer after verifying all STAC IP configuration settings, you may have a firewall issue blocking access. STAC IP requires that TCP port 8080 be open on your system to operate correctly. You may need to configure your firewall or router to enable this port.

DELIVERING STAC IP OUTSIDE THE LAN ENVIRONMENT

It's fairly straightforward to serve STAC IP information around a LAN, but things become more complex when STAC IP needs to be delivered over the public Internet. In essence, STAC can be treated like any other Internet server in that it requires a known, public IP address to be accessed. If your network infrastructure has a firewall that prevents unsolicited traffic from entering or blocks off all ports other than those that are "well-known" or uses Network Address Translation (NAT), you will need to modify your network to allow STAC to deliver STAC IP to the outside world.

It's not possible to make specific recommendations on how to alter anyone's network to allow this. We recommend consultation by an IT professional to set up or make changes to your network. We can, however, make the following general suggestions:

1) If you cannot remotely access STAC IP, don't assume that it's always the fault of the network on the STAC side. Double check the STAC IP settings (especially the netmask and gateway settings). Try a different computer. Be sure you have Macromedia Flash 6 or higher installed. Try another browser if possible.

35

2) By definition, Network Address Translation (NAT) and Internet servers are not compatible. If your network uses NAT, you will need to locate STAC in front of the NAT. To obtain a publicly accessable IP, or create a DMZ in your router to allow public access to the STAC. STAC uses TCP ports 80 and 8080.

3) If you do suspect firewall issues, try opening port 8080 to TCP traffic on your firewall. You'll need this port to be open on your client's firewall as well.

4) If you do find that your network won't allow a server, investigate a Virtual Private Network (VPN). This will allow you to keep your firewall security settings for the general network, but looser settings for STAC, with the VPN providing its own security.

5) A VPN is a good idea even for those without network access issues. STAC only provides a simple password protection and allowing external access only via VPN increases security dramatically.

6) Check the Comrex support page at **http://www.comrex.com/support** for updates. We will post any info we get on network compatibility.

SECTION 6   STAC HYBRID SETUP AND OPERATION

STAC BLOCK DIAGRAM

STAC contains two high-performance digital hybrids. The digital hybrids in STAC can be treated independently from the telephone line switching and hold functions in STAC. STAC hybrids are only utilized on calls that have been put *On Air*. A block diagram of the STAC system is shown in the figure below.
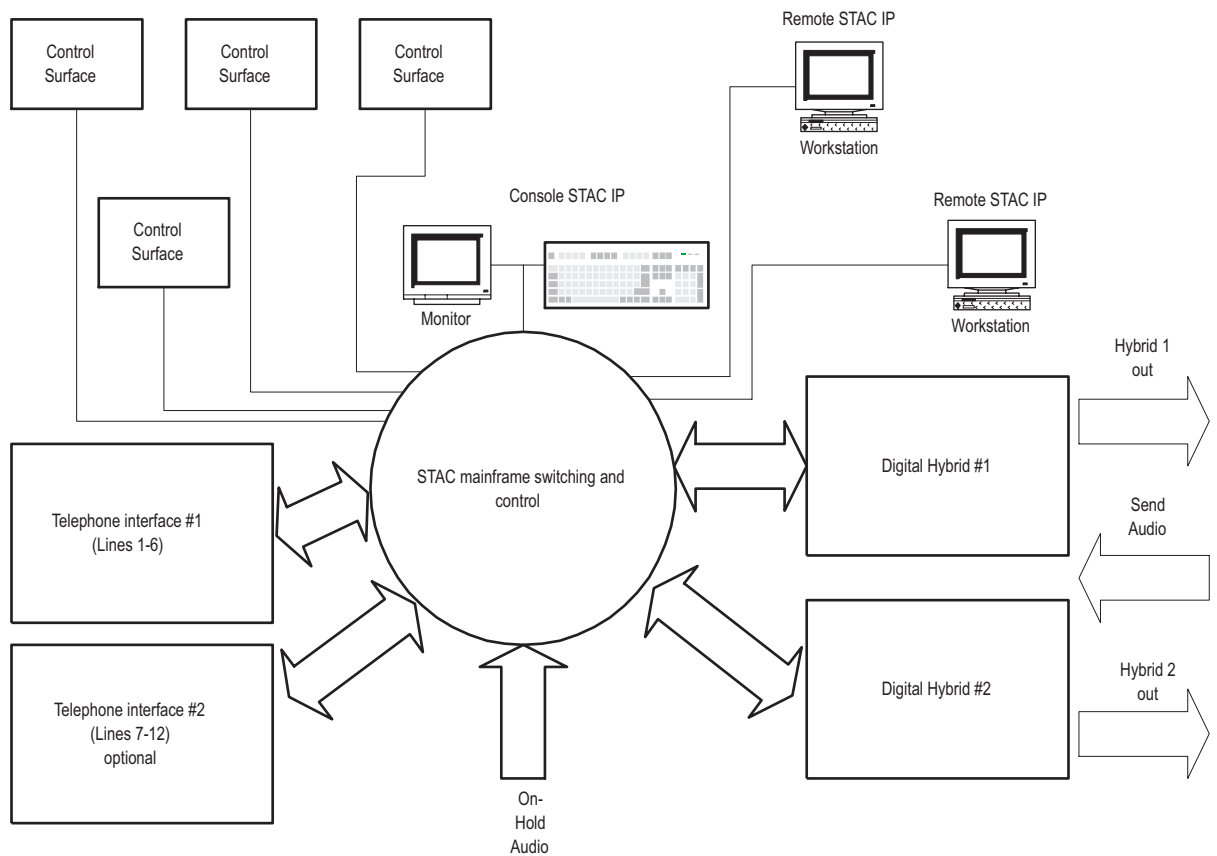
ABOUT HYBRIDS IN GENERAL

Simply put, a hybrid is a device that separates send and receive audio on a phone line. While the public switched telephone network utilizes separate channels for audio in each direction of a phone call, these two signals are mixed together before being sent to the end user. This way, only one pair of wires is required from your telephone to the telco central office. To use telephone company terms, the telephone network is a "four wire" system, while the local loop is a "two wire" system.

When recording or airing telephone conversations in a studio environment, it's important that telephone audio be "four wire". This is because the audio program usually already contains the audio of the studio host. If the telephone audio also contains some of the studio audio, these two signals will be added together by the mixing console. The effect will be distortion in the voice of the studio host. In essence, a hybrid converts the "two wire" telephone line back into a "four wire" audio path.

It seems counter intuitive, but the main goal of a studio hybrid is to improve the sound of the people in the studio, not the callers. If the hybrid isn't working well, people speaking from the studio will sound "hollow" or like they're "talking into a barrel". This is due to the strange effect of mixing microphone audio with telephone "bleed-through". Of course, our hybrids also improve the audio of callers, filtering out hum and noise as well as adjusting levels between loud and soft speakers.

It is our opinion that with the advent of cheap telephones, cordless phones and cellphones, telephone audio has gotten decidedly worse in recent years. While a hybrid can clean up noise to some extent, it cannot remove distortion caused by the far end telephone. If you find some calls sound good on the air and some don't, it's probably due to the large disparity in audio quality of today's telephone sets.

STAC uses digital signal processing (DSP) technology to continually adapt to telephone-line conditions – providing consistent, high-quality sound and send-to-caller separation. The hybrids help bring uniformity and high quality sound to a broadcast talk show environment.

ABOUT THE STAC HYBRIDS

STAC contains two digital hybrids. Only one STAC hybrid is used in normal use (e.g. contests, requests, interviews). Both hybrids are utilized only when more than one call is on the air at the same time. This is done by *Locking* one call on the control surface (or STAC IP) and putting another call on the air.

Callers on both hybrids will hear audio applied to the **Send Input** on the STAC mainframe. Audio from the caller(s) on Hybrid 1 is available on the **Hybrid 1 Output** port. Audio from the caller(s) on Hybrid 2 is available on the **Hybrid 2 Output** port. Audio from callers on both hybrids is available on the **Aux Output** port. Hybrid 1 caller audio is also routed to Hybrid 2 and Hybrid 2 caller audio is routed to Hybrid 1. This allows callers to hear each other as well as the studio-generated audio. This also allows a single "mix-minus" (audio without any callers) to be applied to the **Send Input**. This function cannot be defeated – i.e. callers always hear the audio from the other hybrid, and two separate "mix-minuses" are not supported. If this function is essential, see *CONNECTION OF AN EXTERNAL HYBRID* on page 44 and *APPENDIX B* on pages 53-57.

Each hybrid is technically capable of supporting two calls simultaneously. This is done by simply summing the lines together in a "button mashing" fashion. If there are differences in level between these lines, this scenario may not perform very well. For optimal hybrid performance, we recommend one call per hybrid.

TELEPHONE SEPARATION/NULL Using Digital Signal Processing (DSP) technology and firmware, the interface between a standard analog POTS line and your audio equipment will result in superior quality audio. The primary function of STAC hybrids is to maximize the null by maximizing the separation of send and caller audio. Both hybrids provide >55 dB null between 250 Hz to 3.5 kHz.

AUTOMATIC GAIN CONTROL AGC normalizes the gain of caller audio, augmenting the level of soft callers, and attenuating the level of loud callers. This helps provide more uniform caller audio levels at the caller output of the hybrid. The AGC threshold is -50 dBm. The AGC works to achieve an average caller level of -30 dBm from the telephone circuit.

AUTOMATIC MIX-MINUS STAC's *Auto Mix-Minus* creates a mix-minus for the hybrids when one is not available from the audio console. See the *ABOUT MIX-MINUS* section on page 40 for further information.

CALLER CONTROL Caller control, also known as ducking, attenuates the caller input audio when send audio is present. The purpose of this attenuation is to allow the talent to dominate their conversation with the callers. The amount of caller control (attenuation) applied to the caller audio is selectable from 0 to 18 dB, in 6 dB increments. For details, see *DIP SWITCHES* on page 12.
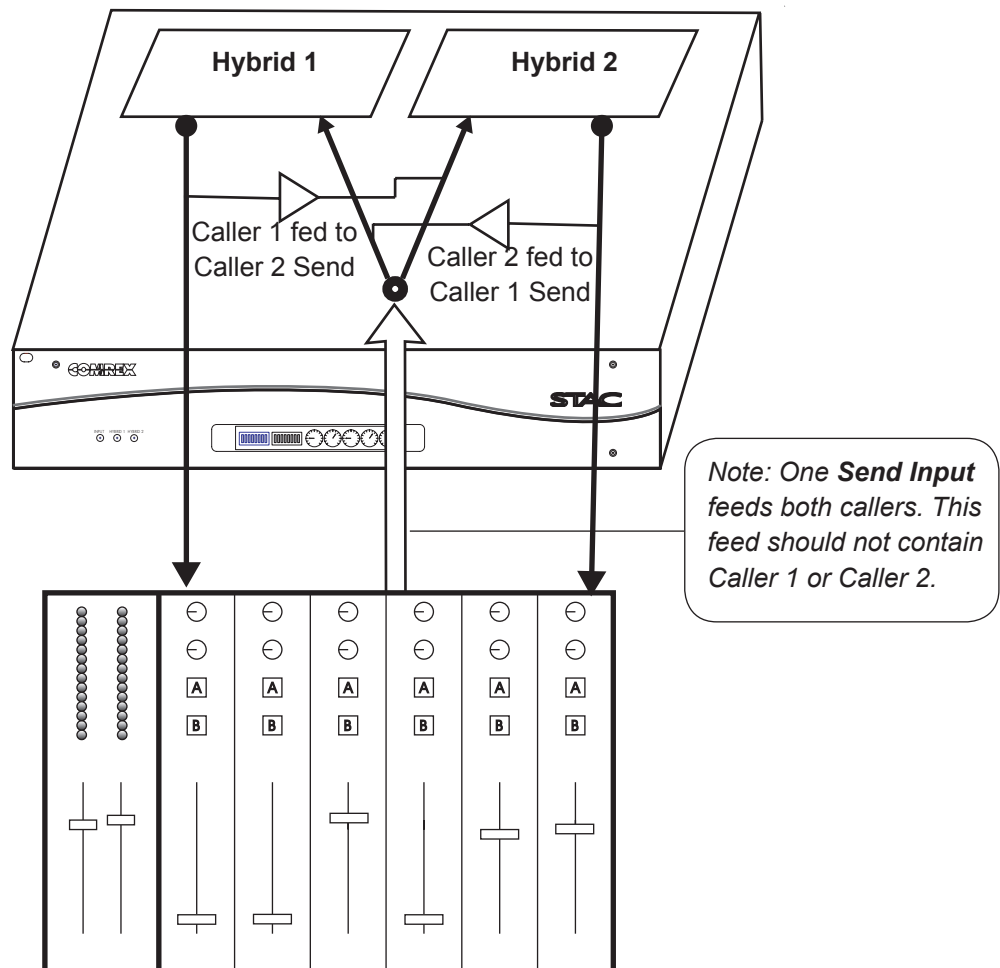
ABOUT MIX-MINUS

Mix-minus refers to the generation of a special audio signal to be fed to callers on the STAC. Essentially, it is a *mix* of all audio being sent over the air *minus* the callers themselves. This feed is only applied to the **Main Send Input** on the STAC. The *On Hold* audio typically contains the entire program feed, including callers.

BUILDING A MIX-MINUS

Mix-minus can be generated several ways, and this section describes many of them.

One important element of the STAC is shown in Figure 1. The STAC has only *one* input for mix-minus. This means that if you intend to use both STAC hybrids, you must generate a single mix-minus feed with *both* callers missing.

Figure 1 - STAC Hybrid Conferencing

Caller 1 fed to Caller 2 Send

Caller 2 fed to Caller 1 Send

*Note: One **Send Input** feeds both callers. This feed should not contain Caller 1 or Caller 2.*

If caller audio is sent back to the callers, the effect will be echo in the caller's ear, or even feedback if the level is too high.

Modern audio consoles can typically provide this special mix for you using either a specialized **Mix-Minus Module** or an **Auxiliary Telephone Bus**. Alternately, you can sometimes use a second, undedicated bus within your console (often called **Aux** or **Audition**) to create this mix. If you have a console with none of these capabilities, you will need to either make custom modifications to your console, use host microphone audio as mix-minus, or (as a last resort) use the *Auto Mix-Minus* feature of the STAC.

OPTION A - CONSOLE PROVIDES TELEPHONE BUS OR AUDITION BUS

This is the simplest arrangement for generating mix-minus for the STAC. As shown in Figure 2A, simply arrange the **Mix-Minus Bus** to provide all audio in the console except for the incoming callers. Feed this bus to the STAC as a mix-minus. In Figure 2B on page 42, the system is shown using the **Audition Bus** on a console.

Figure 2A - Console Provides Mix-Minus Bus
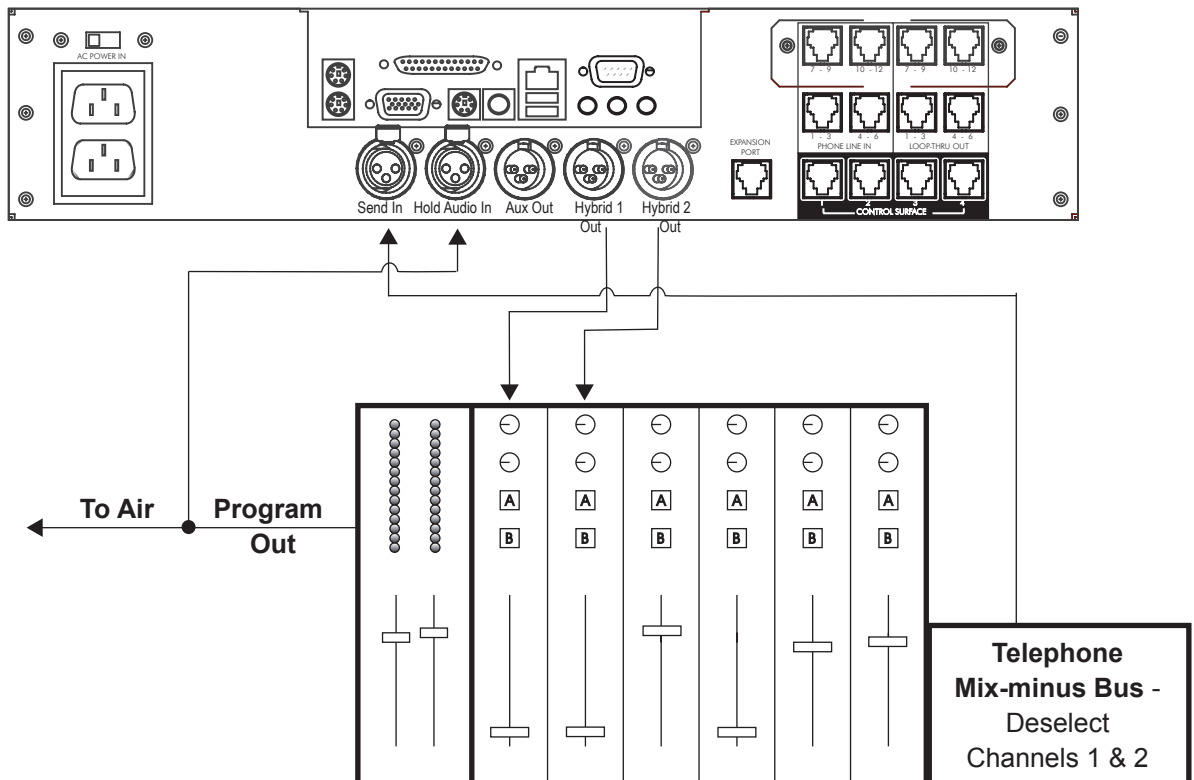
OPTION A - (CONTINUED)
CONSOLE PROVIDES
AUDITION BUS

Figure 2B - Using Audition Bus on Console
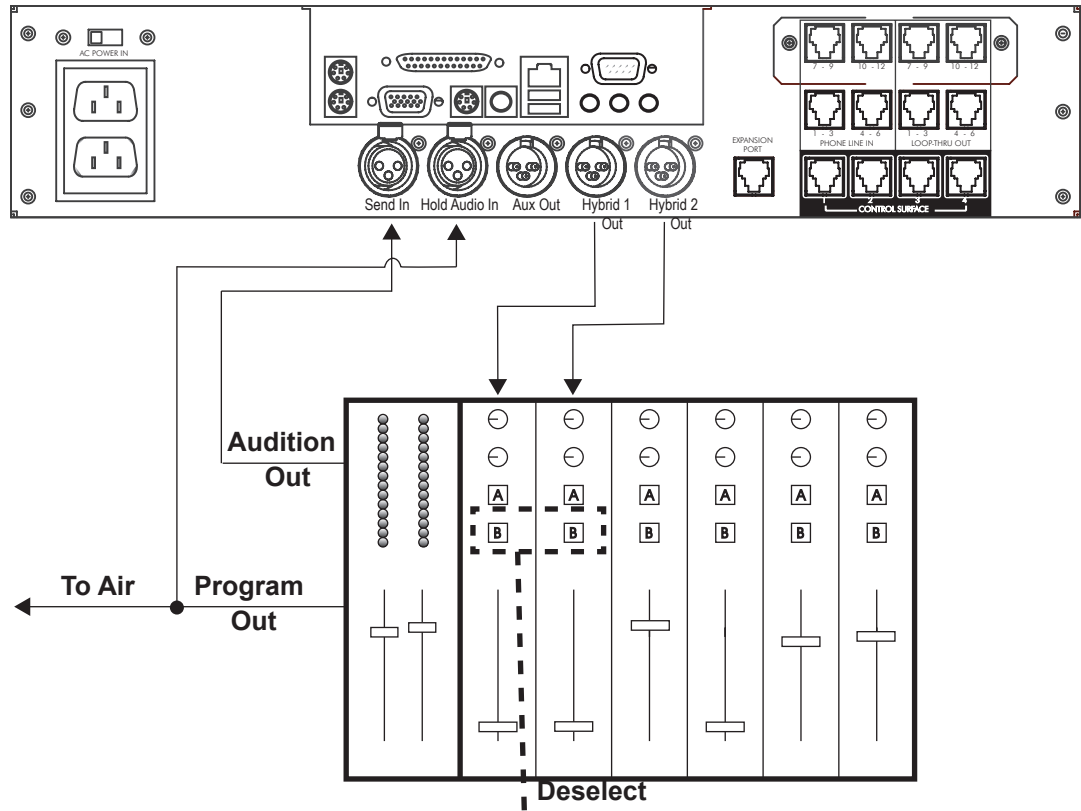
OPTION B - CONSOLE
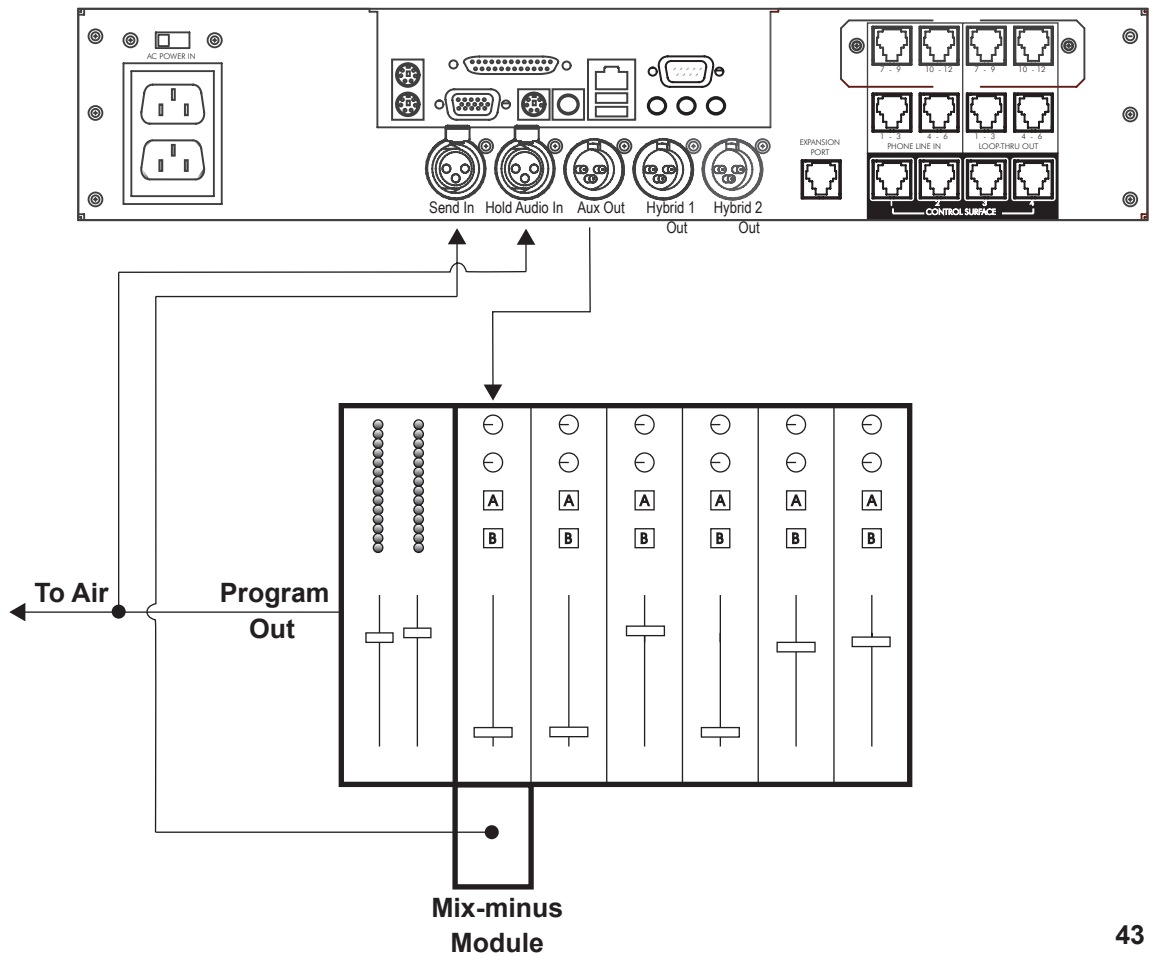PROVIDES MIX-MINUS
MODULE FOR SELECT
CHANNELS

If you plan to use both STAC hybrids (more than one call at a time) then you will need to provide a mix-minus with both callers removed. See if your module can be configured to remove more than one of the incoming fader signals from the mix-minus port. If this is possible, remove both caller audio channels and treat it like a **Telephone Bus** as in option A.

If your module only subtracts one signal from the mix-minus, you can use a single fader for both caller outputs. Do this by using the **Aux Out** output rather than the individual caller outputs on the mainframe. Make sure **DIP Switch 3** on the mainframe is in the *OFF* position so that your **Send Audio** is not included in this mix. Then run this output to your single fader channel, and use the mix-minus (generated by the fader module) as your "send" input to the STAC mainframe. This is shown in Figure 3.

Note: If two separate caller faders are required, see OPTION C ON page 44.

Figure 3 - Using Mix-Minus Module

In cases where it is essential to have two distinct send signals, it is possible to connect an additional stand-alone telephone hybrid (like the Comrex DH20) to the STAC via the **Hybrid Expansion Port** on the STAC mainframe rear panel. Essentially, the STAC mainframe will control the lines and instead of forwarding calls to one of its internal hybrids, it will forward them to your external hybrid. This will provide a separate send and receive audio port on the external hybrid, as shown in Figure 4. This mode requires special jumper configuration on both the STAC and the DH20, as well as special connections between them. See *APPENDIX B CONNECTING AN EXTERNAL HYBRID TO STAC*, pages 53-57.

Figure 4 - Connecting External Hybrid

Several options still exist for those who can't create a mix-minus of any kind on their console. For those with electronic experience, it is possible to build a mix-minus "nulling" device using the post-fade signal of each caller fader in your console. Essentially, you can build an analog subtraction circuit to remove these signals from the main console output.

It's also sometimes reasonable not to build a mix-minus at all, but rather to tap the main studio microphone signal before the console and feed it directly into the STAC **Send Input**, as in Figure 5. Note that callers will not be able to hear anything other than the host microphone while *On Air* (no commercials, music, or other audio sources) but this may be suitable in some circumstances, since the caller will hear the entire program mix while *On Hold*. Set **DIP Switch 1** on the STAC mainframe to *ON* to make the **Send Input** compatible to a microphone level.

**Figure 5 - Feeding Mic Audio Only**
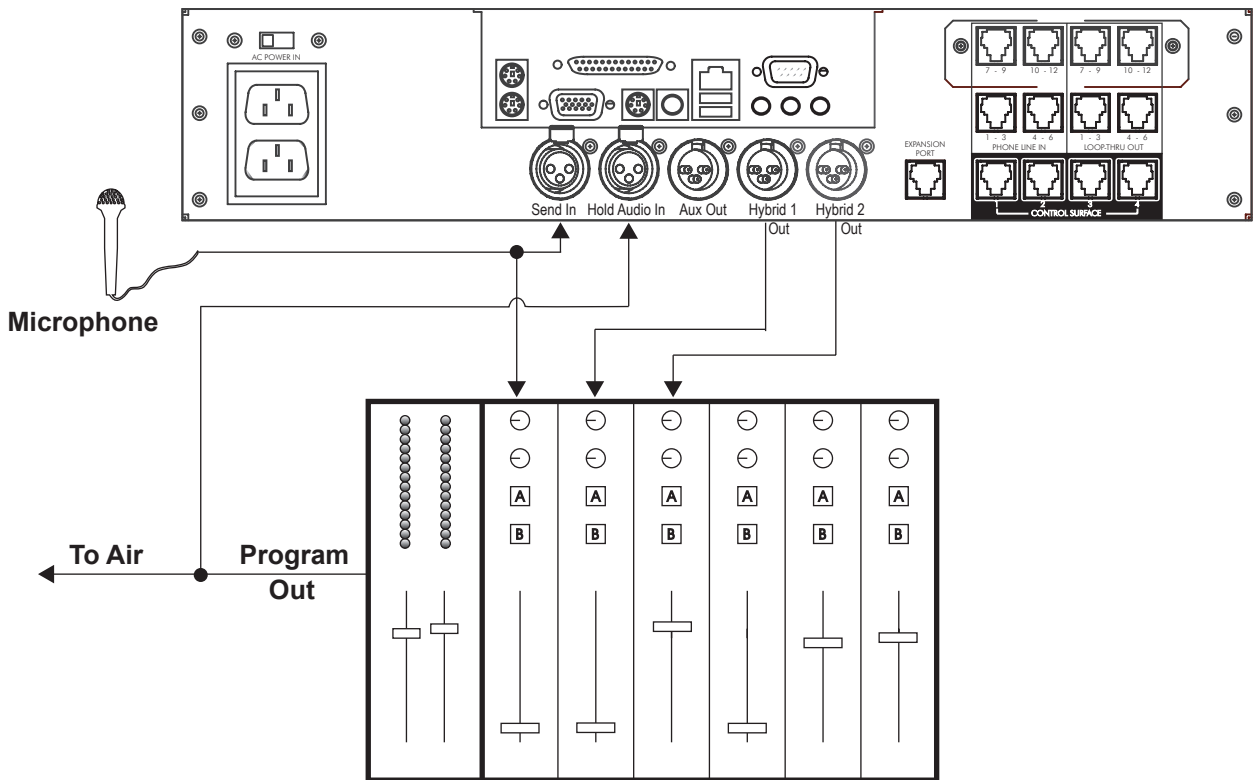
OPTION E - USING AUTO MIX-MINUS FEATURE

Finally, the STAC provides an *Auto Mix-Minus* function which can provide some utility. Due to its limitations, use of this mode is discouraged. By setting **DIP Switch 8** on the STAC mainframe to *ON*, you can apply a full program feed to the STAC, including caller audio. The STAC will attempt to dynamically remove each caller from his outgoing feed. This adaptation requires a completely unprocessed and linear signal at the **Send Input**, like that coming directly off the console. Any clipping or dynamic range processing done in the console will produce distortion in this process. Also, there is some time required for the *Auto Mix-Minus* generator to adapt, so the caller may hear some echo at the beginning of a call. Finally, if the caller level is adjusted during the call (via the fader) the auto-mix minus will need to re-adapt to the call, providing more echo.

In this mode, you can simply bridge the **On Hold Input Audio** to the **Send Input** as shown in Figure 6, since these are likely the same signals.

**Figure 6 - Using Auto Mix-Minus**
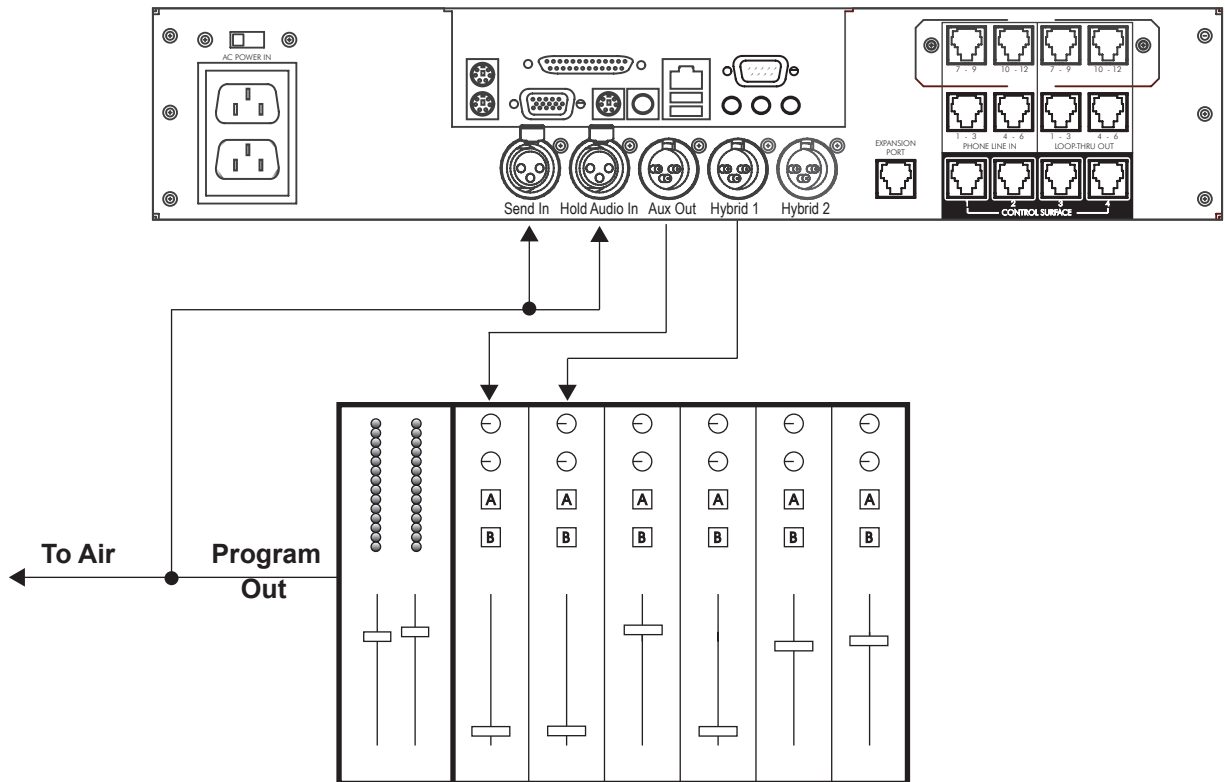
For studios that require multiple mix-minus feeds, such as for multiple remote sources like codecs, the Comrex Mix-Minus Bridge can be used to build up to five discrete mix-minus signals. For more information, see **http://www.comrex.com**.

TRIM POTS

The front panel trim pots provide level adjustments of the **Send**, **Aux Send**, **Aux Out** and **Caller Out** audio connections. Separate audio level controls let you optimize the audio level(s) of STAC to match the audio levels required by the interfaced audio equipment.

In order to optimize the audio levels, have someone call the hybrid from another location. Answer the line on a control surface and make adjustments to the **Send In**, **Hold Audio**, and **Caller Output** controls. Be aware that some suppression and/or echo may be heard while calibrating the audio levels. Disregard this and continue until the end of the procedure. When the hybrid is properly calibrated there will be no echo or suppression.
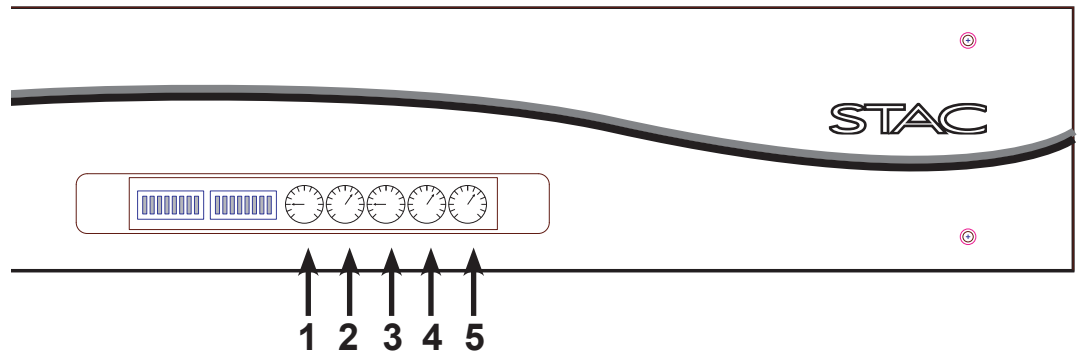
1) SEND LEVEL ADJUST

This pot adjusts the audio sent to callers when they are *On Air*. Adjust this pot along with your console audio control until callers verify that the audio level they are receiving is at a comfortable listening level. With comfortable listening levels, the **Send LED** should illuminate solid green with an occasional flash of amber on audio peaks. If the **Send LED** illuminates red, the audio levels are clipping and should be decreased via the send level adjustments.

2) ON HOLD SEND AUDIO ADJUST

This pot adjusts the level of the audio sent to callers when they are placed *On Hold*. This is usually a complete, undelayed program feed. Adjust this pot along with your console audio control until callers verify that the audio level they are receiving is at a comfortable listening level.

3) AUX OUT RECEIVE AUDIO ADJUST

This pot adjusts the level of send and caller audio at the **Aux Out** connector. Adjust this pot along with your console audio control to set the proper level for your recording device or other external devices.

4) HYBRID 1 OUT   This pot adjusts the **Hybrid 1 Out** audio. Adjust this pot along with your console audio control to set the caller's voice/audio to a comfortable listening level.

5) HYBRID 2 OUT   This pot adjusts the **Hybrid 2 Out** audio. Adjust this pot along with your console audio control to set the caller's voice/audio to a comfortable listening level.

Note: The caller trim pots have no effect on the caller LEDs. The caller LEDs indicate actual level from the telephone lines only. If the caller LED flashes green only occasionally with caller audio, the level from the telephone line is too low and you should activate *Caller Boost* by setting **DIP Switch 2** to *ON*. (See *DIP SWITCHES* on page 12.)

Please visit **www.comrex.com** to register your STAC and to check for future enhancements and availability of upgrades. To learn about other Comrex products please contact **info@comrex.com**. Technical questions may be directed to **techies@comrex.com**. To talk to us on the telephone, please call **+1 978-784-1776**. Enjoy your STAC!

APPENDIX **A**   C**ONFORMITY AND** R**EGULATORY** I**NFORMATION**

SUPPLIER'S DECLARATION OF
CONFORMITY

Place of Issue: Devens, Massachusetts

Date of Issue: November 15, 2004

Comrex Corporation, located at 19 Pine Road, Devens, MA in the United States of America hereby certifies that the Comrex STAC System bearing identification number US:DXDKF08BSTAC complies with the Federal Communications Commission's ("FCC") Rules and Regulations 47 CFR Part 68, and the Administrative Council on Terminal Attachments ("ACTA")-adopted technical criteria TIA/EIA/IS-968, Telecommunications – Telephone Terminal Equipment – Technical Requirements for Connection of Terminal Equipment To the Telephone Network, July 2001.

Comrex Corporation hereby asserts that the Comrex STAC System complies with §68.316 of the FCC Rules and Regulations defining Hearing Aid Compatible ("HAC") and, as such, is deemed compatible with hearing aids.

_____
Thomas O. Hartnett, Vice President, Comrex Corporation

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

49

No. 62-4323

Declaring Party: Comrex Corporation
Address: 19 Pine Road
                        Devens, MA 01434

Terminal Equipment: **Comrex STAC System**

The product described above is in conformity with:
     Document No.: CS-03, Part I
     Title: Harmonized Requirements for Terminal Equipment,
     Terminal Systems, and Certified Protection Circuitry
     Edition/Date of Issue: Issue 8/March 5, 2001

Additional Information:
     Telephone talk show system designed for use in radio/TV stations or
     audio production facilities.

Place of Issue: 19 Pine Road, Devens, MA 01434
Date of Issue: November 2, 2004

Thomas O. Hartnett, Vice President

(Name & Function)   **(Signature)**

*EC DECLARATION OF
CONFORMITY FOR
R&TTE DIRECTIVE*

We:

Manufacturer's Name: Comrex Corporation

Manufacturer's Address: 19 Pine Road
                                                        Devens, MA 01434
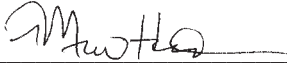
hereby declare on our sole responsibility that the product:

**Comrex STAC System
Telephone Talk Show System**

to which this declaration relates is in conformity with the essential require-
ments and other relevant requirements of the R&TTE Directive (1999/5/
EC). This product is compliant with the following standards and other
normative documents:

European EMC Directive (89/336/EEC)
          EN 55022, Class A
          EN55024: 1998 (Immunity, ITE Equipment)
Low Voltage Directive (72/23/EEC)
          EN 60950: 1992

Information regarding configuration of this equipment for operation on
the telephone networks of the EC countries may be found in the STAC
product manual.

Contact person: Thomas O. Hartnett, V.P., Engineering

Signed:_____

Date: November 15, 2004

REGULATORY INFORMATION

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA, as well as the applicable Industry Canada technical specifications. On the bottom of this equipment is a label that contains, among other information, a product identifier in the format US: DXDKF08BSTAC. If requested, this number must be provided to a U.S. telephone company.

Telephone line connections to the Comrex STAC are made via 8-pin modular connectors wired as described in this manual. Customers needing RJ-11C terminations should contact Comrex Corporation or one of its dealers to order STAC "break-out" adapters.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. The sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for the Comrex STAC is 0.8, and is shown as the digits represented by 08 in the product identifier US:DXDKF08BSTAC.

If the Comrex STAC causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of this equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with the Comrex STAC, please contact Comrex Corporation at 978-784-1776 for repair or warranty information. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is solved.
No user serviceable parts are contained in this product. If damage or malfunction occurs, contact Comrex Corporation for instructions on its repair or return.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information. This equipment cannot be used on telephone company provided coin service.

If you have specially wired alarm equipment connected to the telephone line, ensure the installation of the Comrex STAC does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

Warning: The STAC's receiver handset has a sufficient external magnetic field that it might attract and hold objects that might cause injury to the user.

APPENDIX B   **CONNECTING AN EXTERNAL HYBRID TO STAC**

Comrex's STAC system integrates two digital telephone hybrids along with control functions, audio on hold, and other conveniences. STAC has a single audio input for both hybrids. This is designed for a single mix-minus input (i.e. an audio feed with both callers removed). STAC provides an audio path between the hybrids so callers can hear one another.

Some circumstances may require the use of two hybrids with independent audio inputs, without the facility for the callers to hear each other from within STAC. STAC does not support this by default, but an external hybrid (such as the Comrex DH20) can be added to facilitate this by providing the ability to configure STAC for either *Split Hybrid Mode* or *Split Studio Mode*.

Split Hybrid Mode — In this mode, you essentially bypass one of STAC's internal hybrids and substitute an external, discrete hybrid. This will provide an independent audio input for that hybrid. An example of this would be a console that only provides a single mix-minus for each fader, with no facility to subtract two signals from its mix-minus feed. It is not possible in *Split Hybrid Mode* to assign selected phone lines to individual hybrids. The hybrids are always assigned to calls on the default 1-2-2-1 order.

Split Studio Mode — This mode also provides a method to bypass one of STAC's internal hybrids and substitute an external, discrete hybrid. The primary difference is that selected phone lines are assigned to the individual hybrids. This mode is useful when two independent studios require a single hybrid telephone system. All calls placed to air by studio 1 are routed to one of STAC's internal hybrid. All calls placed to air by studio 2 are routed to the external hybrid. Studio 1 would control lines 1-6 and studio 2 controls lines 7-12 of STAC with twelve line operation. STAC6's internal hybrid would control lines 1-3 and the external hybrid controls lines 4-6.

The instructions assume you will be connecting a Comrex DH20 to STAC. The DH20 hybrid processing is identical to STAC, so both hybrids should sound identical. Only North American versions of DH20 may be connected this way (Pan Euro and Australian models don't support *Dry Mode*).

To configure STAC for *Split Hybrid* and *Split Studio Modes*:

1) Determine whether you want to bypass Hybrid 1 (the first hybrid assigned) or Hybrid 2 (only used during conferencing), or both in STAC.

2) Open the top cover on STAC. Remove the one or two telephone interface boards from the unit, noting cable connections.

53

3) Locate **Header J27** on the main PC board in the bottom of the chassis. Note this is located partially under the embedded PC board, and you may need to remove this as well for clear access. (You can typically pull the embedded PC board out of the way without removing all the cables.)

Figure 7 - Location of Header J27
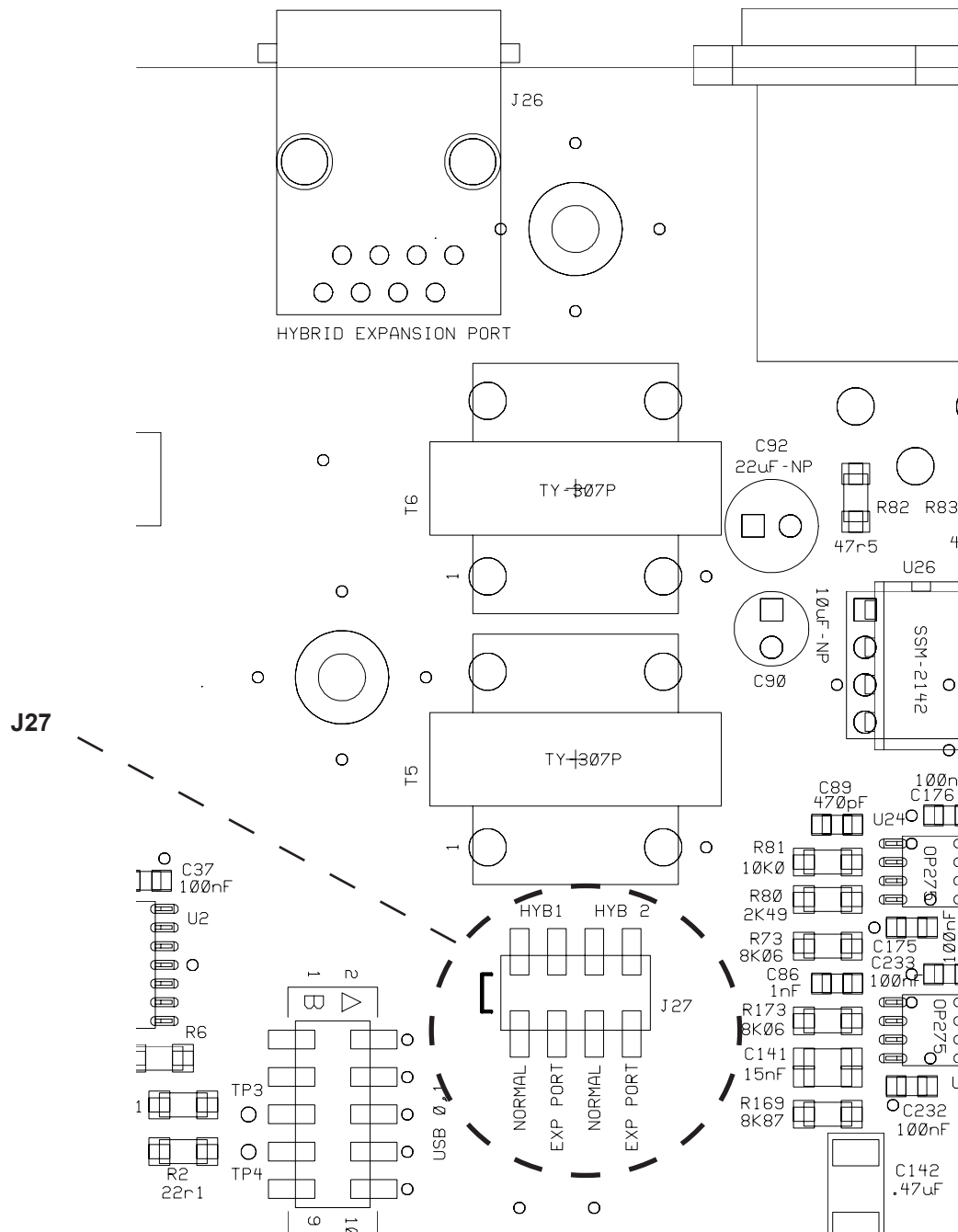
4) Determine which STAC hybrid is to be bypassed and move the jumper(s) designated by the legend for Hybrid 1, Hybrid 2, or both to the **External Port** position. This audio for the selected hybrid(s) will now be transferred to the **Hybrid Expansion RJ-45** on the rear panel, rather than the internal hybrid(s).

5) Reassemble the boards into STAC and replace the top cover.

6) Remove the cover of the DH20 and locate **Header J17.** (See Figure 8.) Move **J17** from its default location to the **Dry Mode** setting. This allows the DH20 to operate without DC current flowing through the line.

Figure 8 - Location of Header J17
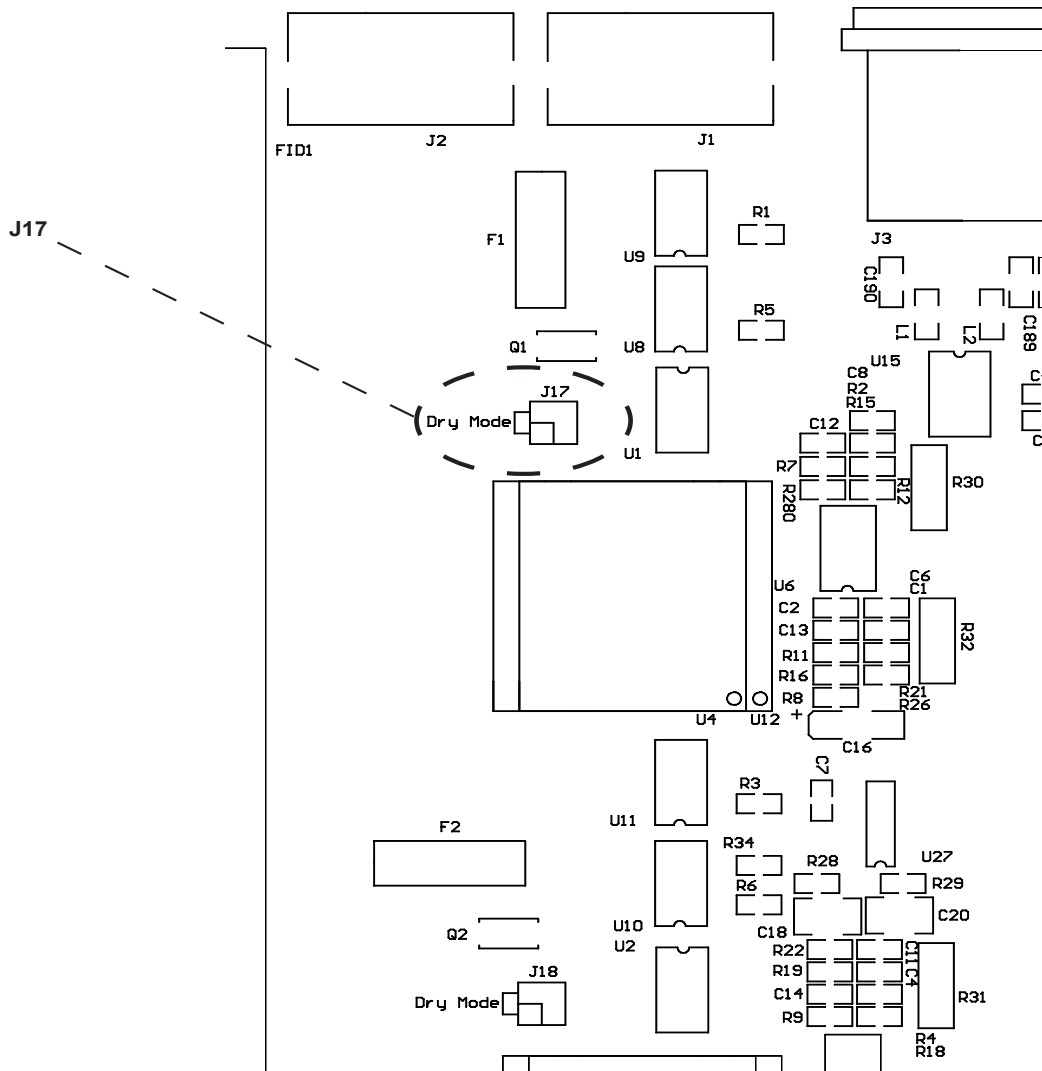
7) Connect **Pins 1 & 25** on the **DB-25 Connector** located on the DH20 rear panel. This allows the DH20 to remain *On Line* at all times.

8) Create a cable to connect between STAC and the DH20. STAC connection will require an RJ-45 (8 position) plug and the DH20 will require an RJ-11 (6 position) plug. This can often be built easily by grafting a telephone cable to an Ethernet style CAT5 cable. *Note: If bypassing both hybrids, a pigtail-style cable can be created, connecting the RJ-45 jack to two RJ-11 jacks. This cable is available from Comrex. Contact us for details.* The cross-pinning is shown below:

Table 9 - Cable Pinout to Bypass Hybrid 1 on STAC

DH20 RJ-11	STAC RJ-45
3	4
4	5

Table 10 - Cable Pinout to Bypass Hybrid 2 on STAC

DH20 RJ-11	STAC RJ-45
3	1
4	2

9) Attach the cable from STAC's **Hybrid Expansion Port** to the DH20 **Tel Line In Jack**.

10) Connect send audio for STAC's internal hybrid to the **Send In Port** on STAC. Connect receive audio to the correct port on STAC for the internal hybrid that was not bypassed.

11) Connect send and receive audio to the DH20. The STAC and DH20 are now set-up for *Split Hybrid Mode.* Proceed to step 12 to configure STAC for *Split Studio Mode*.

12) Enable *Split Studio Mode* by moving **DIP Switch 14** on STAC mainframe to the ON/UP position. This changes the standard hybrid assignment sequence from 1-2-2-1 to STAC controlling lines 1-6 (or 1-3) and the external hybrid would have control of lines 7-12 (or 4-6).

Here are a few details to know when using *Split Studio Mode*:

1. *Priority Queue -* This feature does not change. The call that has been placed on hold or screened hold the longest will be marked by the special priority indication whether it be on STAC or the external hybrid.

2. *Next -* This function is disabled.

3. *Conferencing -* Because each of the hybrids have two calls slots, each hybrid can conference a maximum of two calls together.