EXACOM[tm]

MODEL VCR-2020

DIGITAL VOICE CALL RECORDER

TECHNICAL Guide

7000134B

EXACOM, Inc.
99 Airport Road
Concord, New Hampshire
(603) 228-0706

COPYRIGHT

DISCLAIMER

EXACOM, Inc. makes no representations or warranties with respect to this publication, software, or product and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. EXACOM, Inc. further reserves the right to revise this publication, software, or product and make changes without any obligation to notify any person of such revisions.

LIMITATION OF LIABILITY

EXACOM, Inc. will not be liable for any damages, including any lost profits, lost savings or other incidental or consequential damages arising out of the use or inability to use this product, even if EXACOM, Inc. or its authorized dealer has been advised of the possibility of such damages, or for any claim by any other party.

EXACOM, Inc. will have its liability limited to the repair or replacement of the supplied original program diskette, associated publication and any part or parts of the product or system for the period of the warranty.

WARRANTY

EXACOM, Inc. will warrant this product against defects in material and workmanship under a limited warranty for a period of one year from the date of shipment. During this one year period the liability and obligation of EXACOM, Inc. will be expressly limited to the replacement or repair of any part or parts of this product or system. This warranty does not apply to the product if it is operated under conditions other than those for which the system was designed. Also, this warranty does not apply if the product has been altered in any way which would be detrimental to the performance or life of the product, or by misapplication, misuse, negligence, or accident.

After the expiration of the warranty period, EXACOM, Inc. will provide the same repair and replacement service at the then-current rate for materials and services.

ISSUE CONTROL (VCR - 2020)

ISSUE	DATE	CHANGE
A	11-01-994	Original Draft
B	5-23-1996	Update

TABLE OF CONTENTS

SECTION **PAGE**

TABLE OF CONTENTS

1.00 INTRODUCTION

1.10 PURPOSE

This manual provides the information necessary to install and operate the EXACOM Model VCR-2020 Digital Voice Call Recorder. It is designed to be a comprehensive guide for installation and maintenance personnel covering installation procedures, maintenance steps and other technical matters. In addition, it provides detailed information on the features and operation of the VCR-2020.

1.20 REGULATORY INFORMATION (FCC)

The Federal Communications Commission (FCC) has established rules which allow the direct connection of the VCR-2020 to the telephone network. Compliance with these rules is essential to maintaining the integrity of the telephone network.

1.21 Telco Notification

Before connecting the VCR-2020 to the telephone network, the local serving telephone company may be given advance notice of intention to use customer provided equipment (CPE) and provided with the following information:

1. Trunk numbers to be connected to the system.

2. The FCC Registration Number located on the VCR-2020.
   (1IJUSA-61233-RC-N)

3. The Ringer Equivalence Number located on the VCR-2020.
   (0.0)

4. The USOC jack required for direct interconnection with the telephone network. (USOC RJ11)

1.22 Incidence of Harm

If the telephone company determines the customer provided equipment (CPE) id faulty and possibly causing harm or interruption to the telephone network. It should be disconnected until repair can be effected. If this is not done the telephone company may temporarily disconnect service.

1.23 Changes in Service

The local serving telephone company may make changes in its communications facilities or procedures. If these changes should affect the use of the VCR-2020 or compatibility with the network, the serving telephone company must give written notice to the user to allow uninterrupted service.

1.24 Maintenance Limitations

Maintenance on the VCR-2020 is to be performed by, or under the direct supervision of the manufacturer or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. If unauthorized alterations or repairs are performed, any remaining warranty may be voided.

2.00 GENERAL DESCRIPTION

The VCR-2020 Digital Voice Call Recorder System is designed to assist emergency service personnel by offering instant playback of recorded calls. Communications are recorded with a time stamp and may be played back instantly to verify important information.

The system is compatible with E-911 systems and will record and display ANI (Automatic Number Identification) for all incoming calls, provided that the ANI is made available to the VCR-2020 in DTMF format.

The VCR-2020 is unique in that it will support up to 20 consoles which are networked together allowing the supervisor to monitor any position on the system without disrupting recording.

2.10 SYSTEM FEATURES

- Record via 1 to 20 consoles per system
- Up to 1000 minutes of storage dynamically allocated
- Ability to save multiple messages from being erased
- ANI (Automatic Number Identification - DTMF) if provided
- Real time clock with time-of-day for message orientation
- Visual display indicators (operator screen)
- Time of day clock
- ANI Display
- Day/date
- Function Control Indication
- Selectable beep tone generator for recording notification
- Headset Jack
- Cassette tape output jack
- Wide dynamic range AGC (automatic gain control)
- Internal 5 watt amplifier, speaker and volume control
- Compatible with ACD's (automatic call distributor : single line or key telephone systems and radio systems
- Serial data input for ANI and/or Time Sync

- Telephone interfacing
  - Voltage or current activated
  - Voice activation (VOR / VOX)
  - External contact closure activation
- Anti-static protection
- FCC Part 15.68 and NRTL Safety Approved (UL)

2.11 ADVANCED FEATURES

- Network capabilities up to 20 consoles/stations
- Fast forward/reverse, pause, slow speed playback
- Supervisor mode capabilities
  - Position select
  - Monitor live or previous recording of other positions

2.20 TECHNOLOGY AND SYSTEM DESCRIPTION

The EXACOM Model VCR-2020 Digital Voice Call Recorder uses proprietary state-of-the-art telecommunication digital signaling processing and semiconductor technology to provide a bridging interface to a single telephone line for voice recording and playback.

GENERAL DESCRIPTION

The EXACOM Model VCR-2020 Digital Voice Call Recorder, referred to as the VCR-2020, consists of a micro processing unit referred to as the Server, which may be configured with 1 - 5 interface cards, each of which interfaces with up to 4 consoles. Thus, a fully loaded system will support 20 consoles. There are two versions of an operator console, a Desktop version (fig. 2a) and a Rack Mount version (fig. 2b).

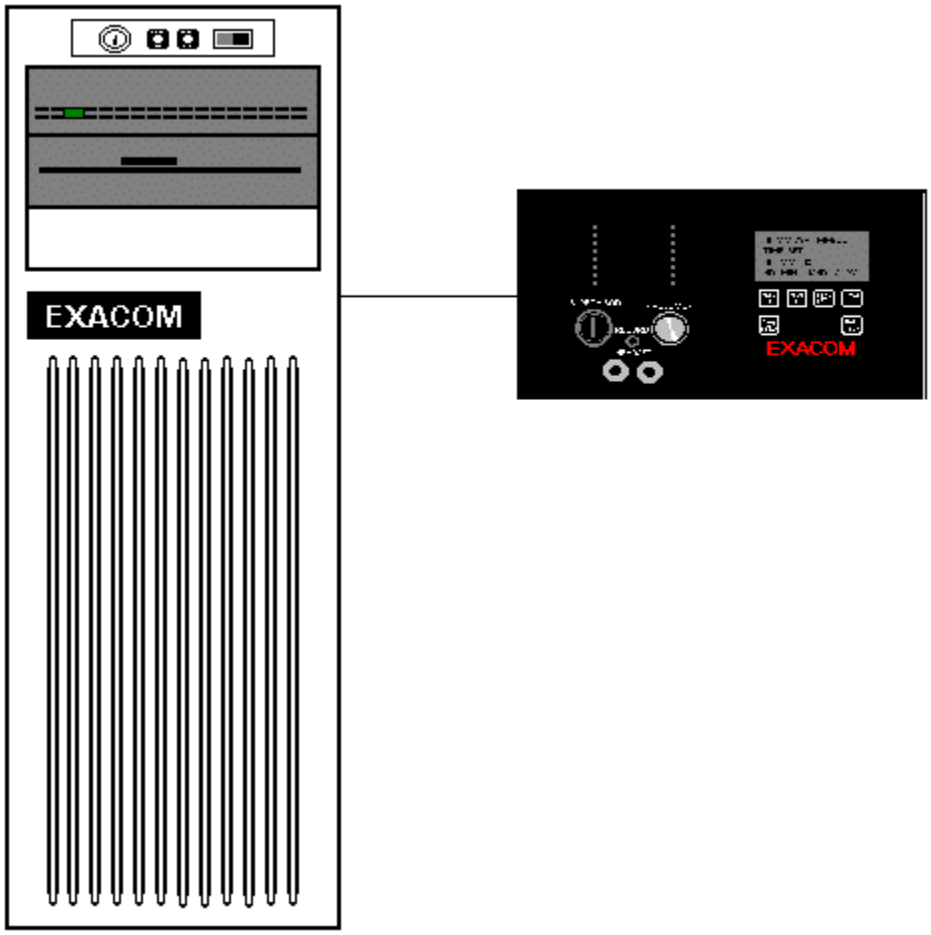


Figure 1a: The VCR-2020 can be configured with a single Operator/Supervisor Console

GENERAL DESCRIPTION

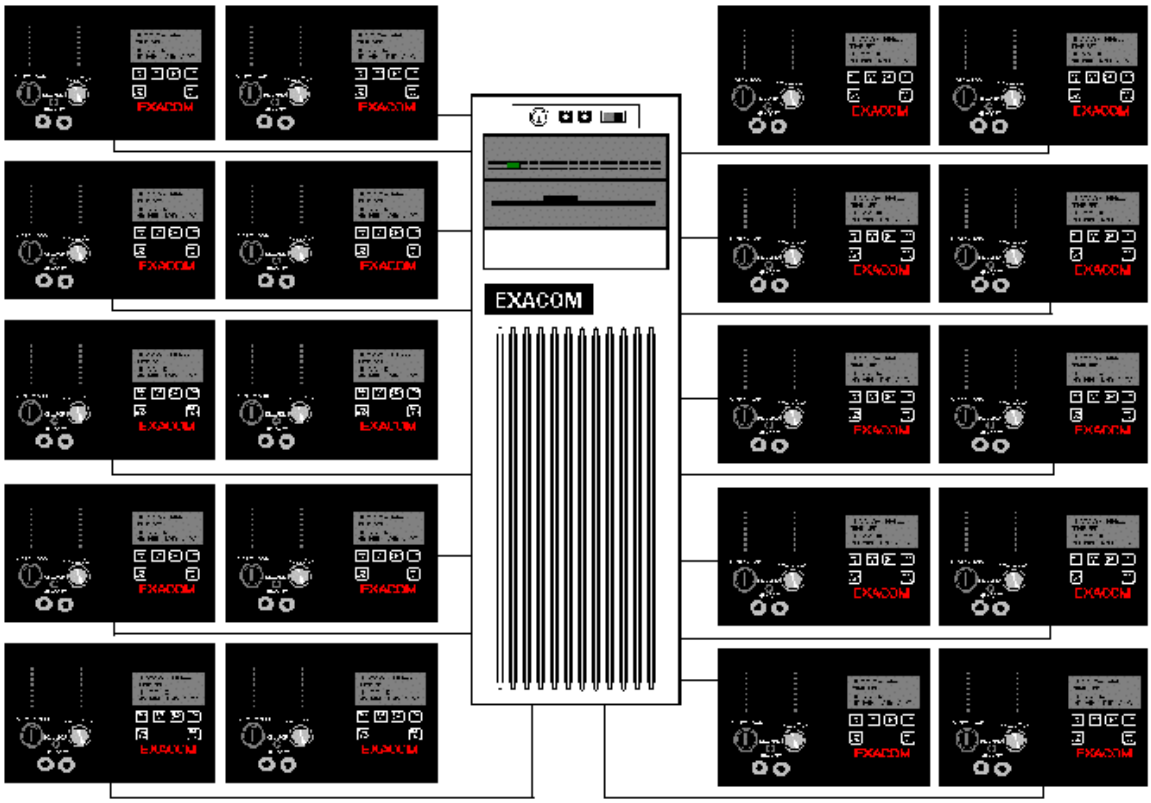


Figure 1b: Up to a total of twenty Operator/Supervisor Consoles

GENERAL DESCRIPTION

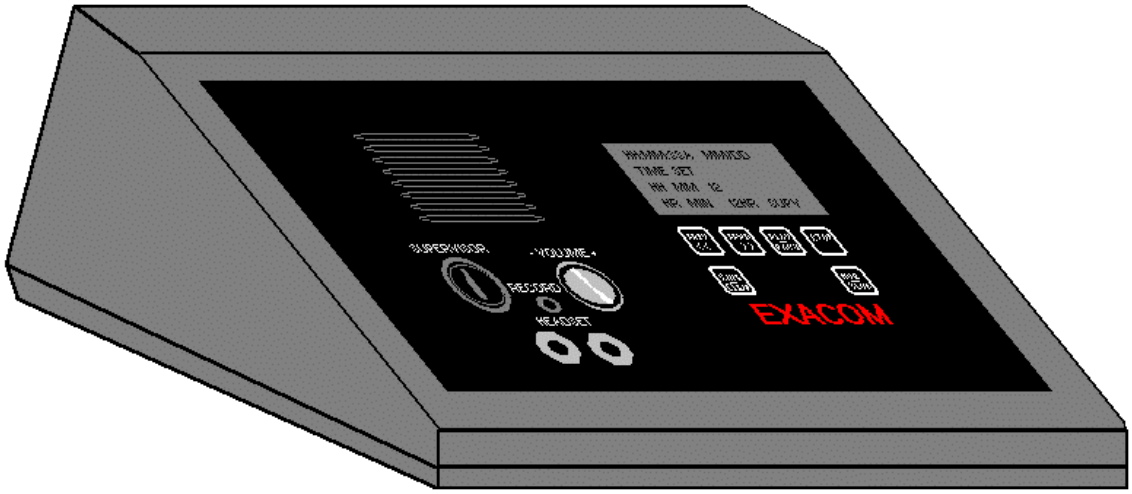


Figure 2a: Table top desktop model

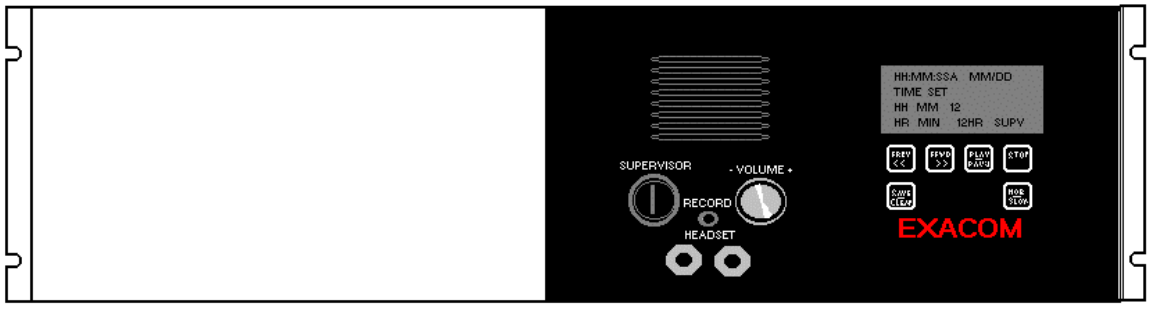


Figure 2b: Single/Dual rack mount (19"x 5¼") model

2.30 SYSTEM COMPONENTS

There are three basic components which make up the VCR-2020:

1. VCR-2020 Server
2. (1 to 5) Interface Cards
3. (1 to 20) Consoles (rack mount or desktop)

2.31 VCR-2020 Server

The Server is an EXACOM Micro Computer System, Disk Controller card, Monitor card, Hard Drive, Floppy Drive, and Power Supply. The Server can be configured for 400 up to 1000 minutes of voice storage.

2.32 Interface Card(s)

The VCR-2020 Interface Card(s) is mounted in the Server and provide a digital communication interface between consoles and the server voice storage unit. Each interface card supports up to 4 consoles. Up to 5 interface cards may be mounted in a server. Interface card installation is performed at the manufacturer and fully configured and tested before shipped. The interface card contains the VCR-2020 program in permanent on-board memory. The VCR-2020 program is self starting on power up and requires no user intervention.

2.33 Console(s) (Rack mount or Desk top)

The VCR-2020 Consoles are self contained units providing the basic user interface to the system through a six-button keypad and four-line backlit Liquid Crystal Display (LCD). Figure 3 shows the layout and describes the functionality of the interface.

The four-line LCD provides visual feedback to the operator. The display provides the operator with time and date of stored messages, as well as other system message related information. In addition, during the first 15 seconds of a call, if DTMF digits are received, they will be stored with the call and displayed during playback. The Console also has a speaker with volume control, headset, and cassette tape output jack for playback monitoring and recording.

GENERAL DESCRIPTION

Consoles are powered by the Server via the COMM jack.

2.34 External Equipment

The VCR-2020 operates independently as a recording device. As such, no external equipment is required for most applications. However, for applications requiring uninterrupted VCR-2020 operation, it is recommended that an external uninterruptable power supply (UPS) be used with the VCR-2020 Server.

Consoles may be powered by an optional plug-in power pack (Sec. 4.32.3) for applications requiring long distances from the Server.

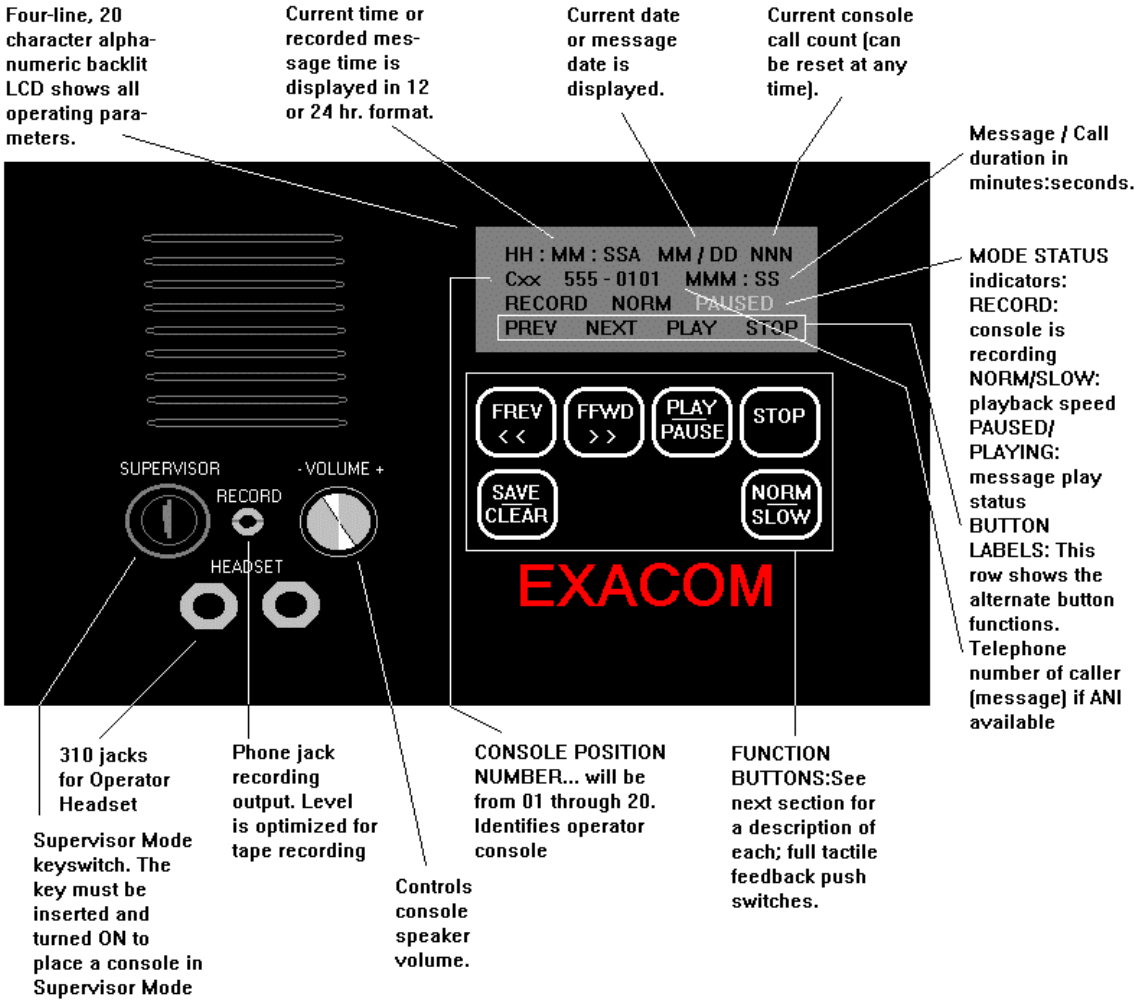


Figure 3: Operator / Supervisor Console Front Panel Detail

3.00 SYSTEM SPECIFICATIONS

3.10 Performance

Digital Codec:	ADPCM
Digitization Rate:	64Kbps
Frequency Response:	300 to 3000Hz
Signal to Noise Ration:	43 db. C message weighted
Distortion:	4% THD (1khz 0 db input)
Audio Input:	-30 dbm to +10 dbm
Input Impedance:	> 5 Meg bridging
Audio Output:	5 watts into speaker

3.11 Controls

Keyboard Type:	6 button membrane
Message Control:	Play/Pause, Stop
FREV/FFWD:	Message Select, Fast Forward/Reverse
Normal/Slow:	Message Play Speed
Memory Control:	Save/Clear
Clock Control:	Display/Set Hrs. Min. Sec
System Control:	Display call counter, Reset call counter, Ready/Play
Monitor Audio:	Playback volume
Supervisor Key:	Key switch to enable Supervisor mode

3.12 Indicators

System Display:	4-line 20 char. alpha/numeric backlit LCD
Audio Indicators:	Speaker, headset jack

3.13 Digital Storage

Memory Type:	Hard Disk
Memory Size:	100MB to 225MB
Recording Time:	400 to 1000 minutes

3.14 Environmental

Ambient Temperature:	0 to 50 degrees Celsius
Humidity:	0 to 95% non-condensing
Storage Temperature:	-18 to 50 degrees Celsius

SYSTEM SPECIFICATIONS

3.15 Electrical

Input power: 115Vac. 60Hz. 217 watts: 220Vac. 50Hz. 217 watts

3.16 Physical

Console (Rack Mount):	5.25"H x 19"W x 9"D
Dual Console (Rack Mount)	5.25"H x 19"W x 9"D
Console (Desk Top):	4.25"H x 10"W x 8"D

4.00 INSTALLATION

4.10 Site Planning

The VCR-2020, like most electronic equipment, should not be subject to harsh environmental conditions. To assure ease of servicing and reliable operation, several factors must be considered when planning the system installation. Always consider the following BEFORE installing the VCR-2020.

A) The VCR-2020 Server may be mounted in several different configurations, table/desktop, or on a shelf in the general area it will be servicing. Each installation should use the configuration best suited to permit ease of serviceability and integration with associated systems.

B) The VCR-2020 Consoles may be 19" rack mounted in the dispatch console or located on the desk top for supervisor functions. In either case the Console should be located as close to the server as possible to provide optimum performance.

C) The VCR-2020 Server power supply operates on 110 or 220 Vac As such, an appropriate receptacle compliant with local electrical codes must be provided within 4ft. of the VCR-2020.

D) The VCR-2020 should be located in a well ventilated area having a temperature range of 0 to 50 degrees C, and a humidity range of 5 to 95% (non-condensing).

E) Accessibility of the VCR-2020 for servicing and lighting.

F) Protection from flooding, flammable materials, excessive dust and vibration.

4.20 UNPACKING THE VCR-2020 SYSTEM COMPONENTS

Remove the VCR-2020 from the shipping carton and place it on a level working area. Remove the plastic wrapping and inspect the VCR-2020 for physical damage. If there is any sign of damage contact authorized service personnel immediately for assistance. The VCR-2020 should be serviced by authorized service personnel ONLY. Do not remove the VCR-2020 power supply cover or warranty may be voided.

INSTALLATION

4.30 VCR-2020 Installation

4.31 Component Checklist

- ❑ VCR-2020 Server
- ❑ VCR-2020 Interface Ports (Cards)
- ❑ VCR-2020 Console(s) (Rack or Desk Top version)
- ❑ VCR-2020 Console Key(s) (one per Console)

4.32 Installation Procedure

4.32.1 Set up the Server

- ❑ Install the interface card(s)
- ❑ If the interface card(s) are not already installed in the VCR-2020 Server the switch settings on the card will have to be set as follows:

Card Position	Switches 1	2	3	4	5	6	7
1	OFF	OFF	OFF	OFF	ON	OFF	OFF
2	OFF	OFF	ON	ON	OFF	ON	OFF
3	OFF	ON	OFF	ON	ON	ON	OFF
4	OFF	ON	ON	ON	OFF	OFF	ON
5	ON	OFF	OFF	ON	ON	OFF	ON

- ❑ Select the AC Power voltage at switch near power cord socket on rear of chassis.
- ❑ Connect the power cord from the rear of the Server to an AC outlet.
- ❑ Connect an RJ22 (handset size) communications cable to a port on an interface card at the rear of the Server:

  Connect one cable per VCR-2020 Console. The lowest port on the VCR-2020 interface card corresponds to the lowest console position on the card. Always start with the lowest port on the lowest numbered card and work up to the highest card and port.

4.32.2 Console Communications Connections

- ❑ Connect the free end of the RJ22 communications cable to the RJ22 jack on the rear of the console labeled COMM.

4.32.3 Powering the VCR-2020 Console

- ❑ If communications cable length exceeds maximum allowable length for wire gauge used (please refer to Appendix A) an external power supply will need to be connected to the jack on the rear of the console labeled EXT. PWR. (please refer to Appendix A for EXT PWR specifications).

4.32.2 Speaker Configuration

- ❑ If the VCR-1776 speaker or headset jacks are to be implemented positions 8 and 9 on the terminal block must be connected to each other. The unit is shipped from the factory with this installed. If the headset jacks are used the console speaker will be automatically disabled.
- ❑ If an external speaker is to be used, remove the jumper between position 8 & 9, and connect the speaker to positions 9 and 10 on the terminal block.

4.32.3 Record Inputs

Two separate inputs are available, each providing a high impedance differential input suitable for connection directly to telephone lines. These are combined internally to the single recording channel. When the second input (positions 3 & 4 on the terminal block, or the second line on the RJ11 jack) is not used, a 1K Ohm resistor should be connected between terminal block positions 3 & 4 to minimize possible noise pickup.

4.32.4 Record Activation Methods

- ❑ Choose one of the following methods to detect and record phone calls and/or radio transmissions.

  A) Voltage Level Start
  B) External Source Start
  C) Loop Current Start
  D) Bridging Across Headset
  E) Radio (through relay closure)
  F) VOR / VOX

Note: The following sections describe each method in detail. Not every method will be appropriate in every case.

INSTALLATION

A) Voltage Level Start: Parallel (Bridging) Connection {Two wire configuration}

This method is best used if more than one phone is connected to the telephone line. This will record activity from any phone on that line, and cannot disrupt telephone service to any phone.

NOTE: *The VCR-2020 Console does not need to be near any of the phones being recorded if the system is configured this way*.

1) On SW1, set switch 2 to the **ON** position. Set switches 1 and 3 to the **OFF** position.
2) Connect a standard phone cable (RJ11) from a phone jack into the VCR-2020 Console at the jack labeled **LINE** (primary pair).
3) Test for proper record operation. Off hook-**RECORD**. on hook-**IDLE**.

NOTE: *The off hook detector for the primary pair is polarity sensitive. With the phone line connected, position 1 on the terminal block must be more positive than position 2 on the terminal block. If it is not, then tip and ring must be swapped prior to the RJ11 jack labeled **LINE***.

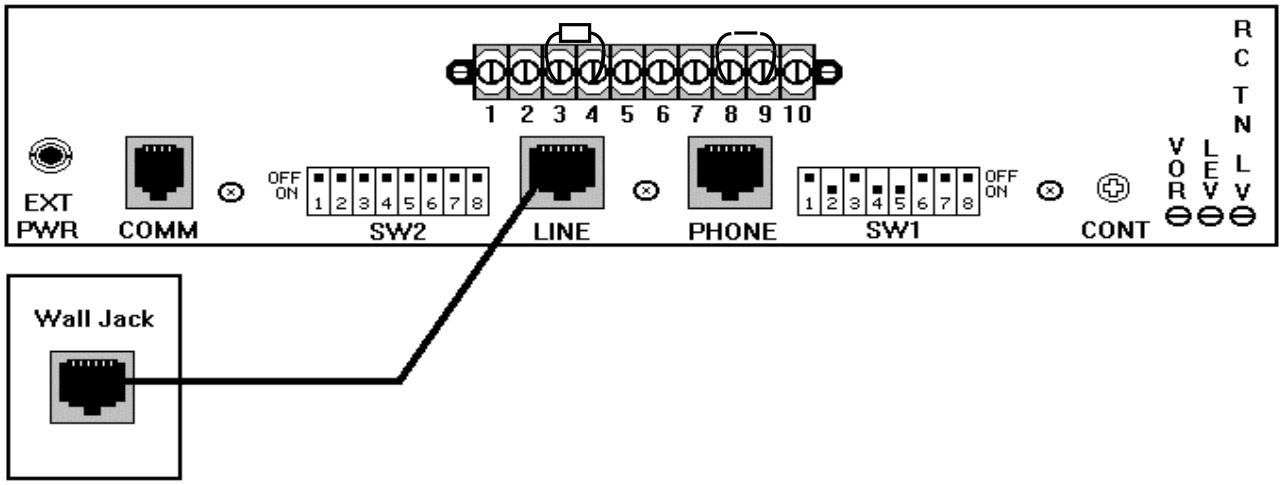


Figure 4: Console Rear Panel Connections for Voltage Level Start

INSTALLATION

B) EXTERNAL SOURCE START:

Used when a signal separate from the phone line is used to activate recording (normally an isolated switch or relay contact, but will also detect changes in voltage).

1) On SW1, set switch 1 to the **ON** position. Set switches 2 and 3 to the **OFF** position.
2) Connect the start signal wires to position 5 and 6 on the terminal block.
3) Connect audio signal to inner pair of jack labeled **LINE** (or to position 1 and 2 on the terminal block).
4) Finally, the VCR-2020 Console will need to be adjusted to detect changes in the voltage level. To adjust:
   a) Boot the system.
   b) Take one of the phones on the line off-hook.
   c) Adjust the Potentiometer in the rear of the VCR-2020 Console labeled **LEV** until the VCR-2020 Console LCD reads **RECORD**.
   d) Place the phone back on-hook and readjust the **LEV** Potentiometer until the VCR-2020 Console LCD reads **IDLE**.
   e) Repeat step b) through d) as necessary until the VCR-2020 responds with **RECORD** when off-hook and **IDLE** when on-hook every time.

NOTE: *The wires connected to positions 5 and 6 on the terminal block may need to be swapped if step e) appears to be working backwards.*

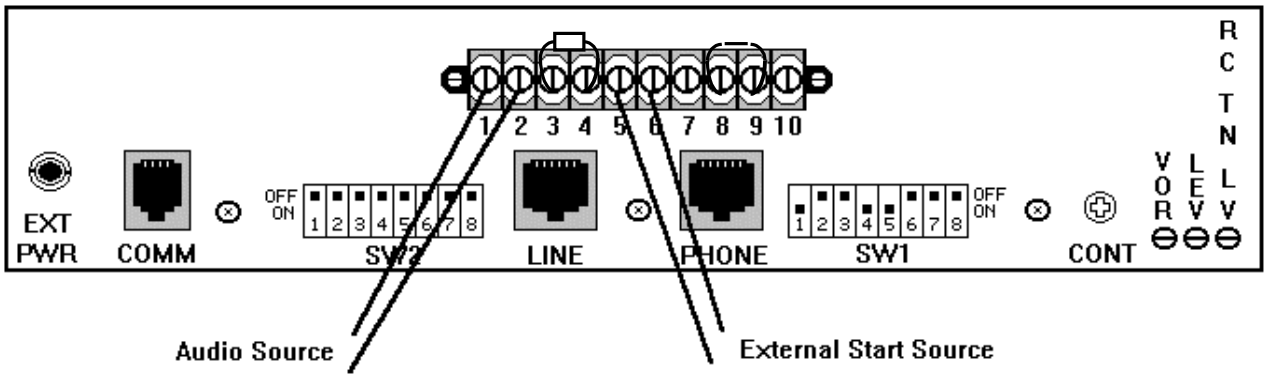


Figure 5: Console Rear Panel Connections for External Source Start

INSTALLATION

C) LOOP CURRENT START: (Two wire configuration)

This mode will only record activity on phones that are in line after the VCR-2020 Console. The telephone line must pass through the console, therefore this configuration is most effectively used when the console is "co-located" with the phone to be recorded.

1) On SW1, set switch 3 to the **ON** position. Set switches 1 and 2 to the **OFF** position.
2) Connect a standard phone cable (RJ11) from a phone jack into the VCR-2020 Console at the jack labeled **LINE**.
3) Connect another RJ11 cable from a phone into the VCR-2020 Console at the jack labeled **PHONE**.
4) Test for proper record operation. Off-hook **RECORD**, on-hook **IDLE**.

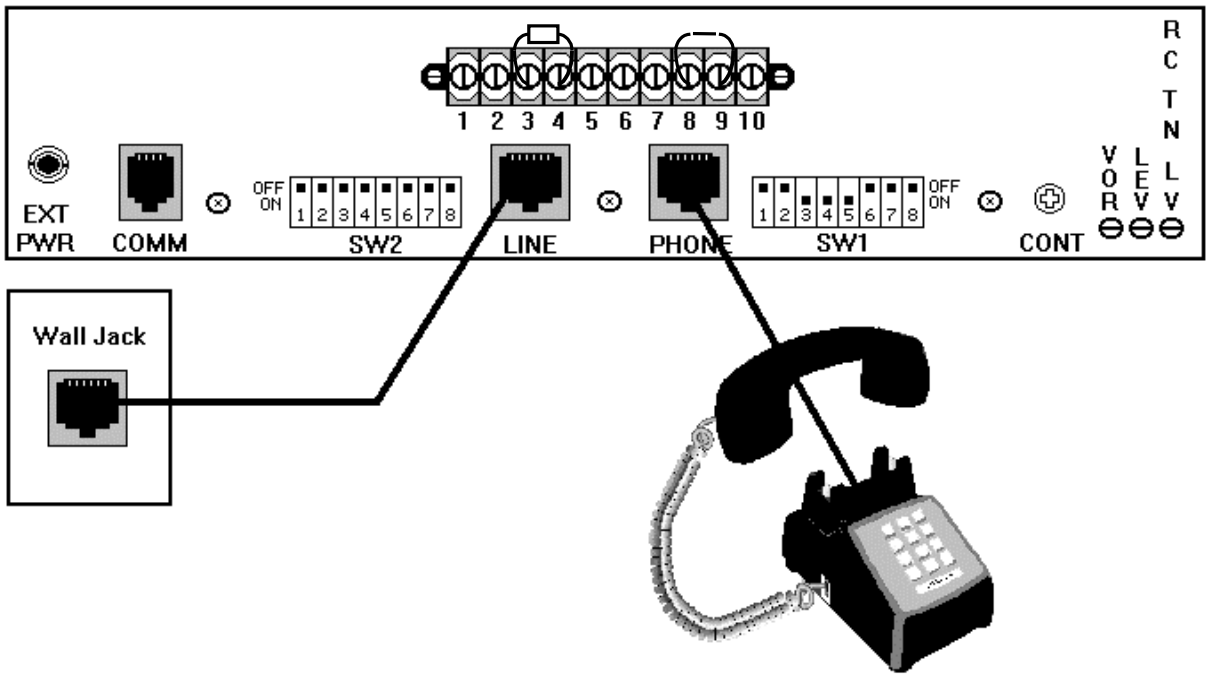


Figure 6: Console Rear Panel Connections for Loop Current Start

INSTALLATION

D) BRIDGING ACROSS HEADSET:

Primarily used on key systems or other systems where an operator headset is the most convenient access point.

NOTE: *This arrangement uses the external source start to detect the DC power to the headset microphone*.

1) On SW1, set Switch 1 to the **ON** position. Set Switch 2 and 3 to the **OFF** position.
2) The primary pair (1 and 2) of the four conductor phone cable will be connected to receiver pair of headset.
3) The secondary pair (3 and 4) of the four conductor phone cable will be connected to transmit.
4) Position 5 must be connected to position 3 and position 6 must be connected to position 4 on the terminal block.
5) Adjust for voltage detection (as in Part B. Section 4, steps b - e).

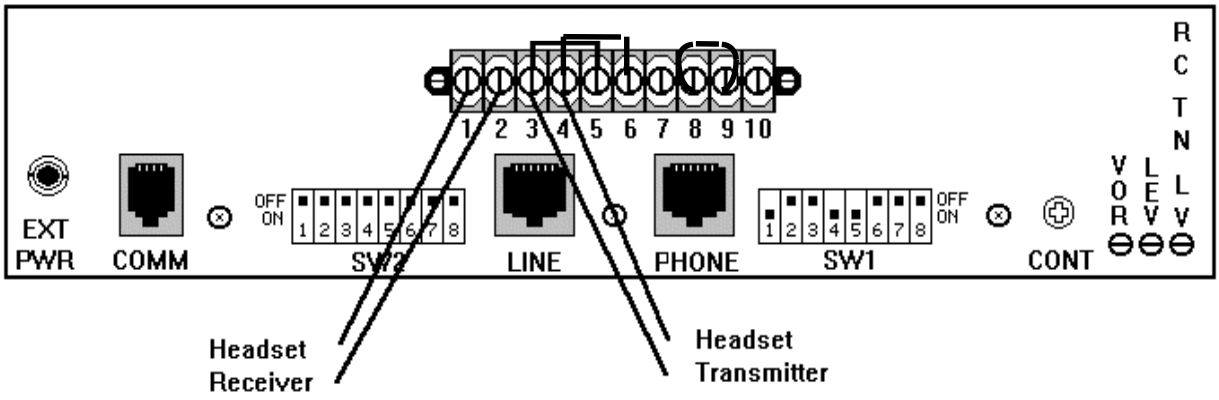


Figure 7: Console Rear Panel Connections for Bridging Across Headset

INSTALLATION

E) RADIO (Contact Closures, PTT)

Uses external start to detect signal from radio equipment.

1) On SW1, set Switch 1 to the **ON** position. Set Switch 2 and 3 to the **OFF** position.
2) Audio sources can be connected either to primary or secondary pair or both. If transmit and receive are separate.
3) Positions 5 and 6 on the terminal block connect to either a dry contact (T,R relay) or PTT (voltage sense).
4) Adjust for voltage detection (as Part B, Section 4, steps b - e).
5) Test for proper record operation. Key closure RECORD, Key open IDLE.

Note: *Remove 1K resistor if input 2 is used.*

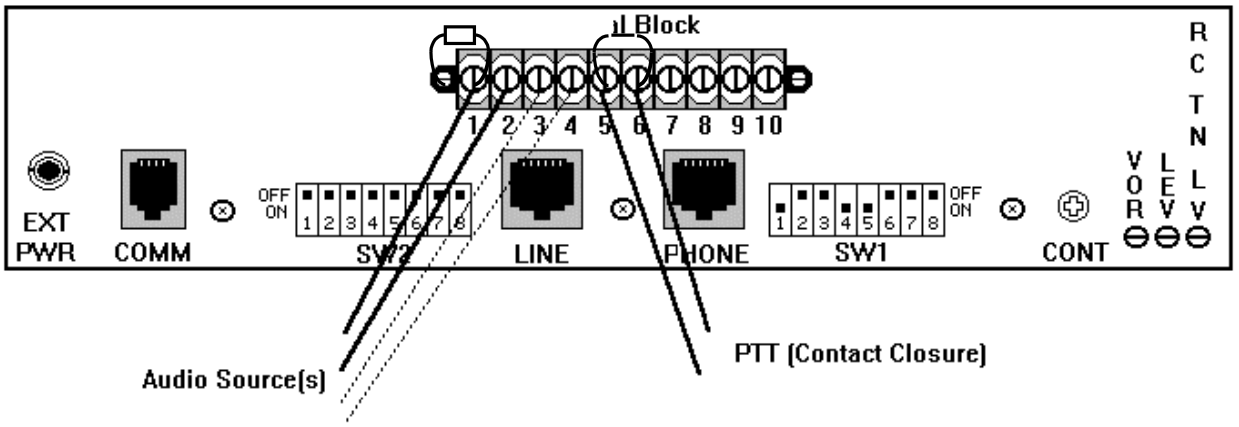


Figure 8: Console Rear Panel Connections for Radio Interface

F) VOR/VOX: (When no external start signal is available.)

1) Connect the audio source to the primary or secondary pair on the jack labeled LINE (or position 1 and 2 or 3 and 4 respectively on the terminal block).
2) Adjust potentiometer labeled VOR to recognize and reject ambient noise. This will establish the ON/OFF levels for VOR/VOX connection.
3) Set Switches 1,2 and 3 on SW1 in the OFF position.

4) VOR/VOX requires some additional switch manipulation to insure correct execution of desired ATTACK and HOLD times.
   a) ATTACK time is the amount of time required for verification of valid audio signals. ATTACK time is adjusted through two switches which present four different ATTACK time settings. (SW2, Switch 3 and 4.)

ATTACK ON TIMES	Switch 3	Switch 4
0.000 sec.	OFF	OFF
0.124 sec.	ON	OFF *
0.250 sec.	OFF	ON
0.475 sec.	ON	ON

*** NOTE:** Use this setting for adjusting VOX level.

b) HOLD time is adjusted using three switches which present eight different HOLD time settings. (SW2 Switches 5, 6 and 7.)

HOLD (OFF) TIMES	Switch 5	Switch 6	Switch 7
VOX Deactivated	OFF	OFF	OFF
4 sec.	ON	OFF	OFF *
6 sec.	OFF	ON	OFF
8 sec.	ON	ON	OFF
12 sec.	OFF	OFF	ON
16 sec.	ON	OFF	ON
24 sec.	OFF	ON	ON
32 sec.	ON	ON	ON

*** NOTE:** Use this setting for adjusting VOX level.

c) Test for proper record operation. Audio RECORD, no audio IDLE (after ATTACK and HOLD times).

INSTALLATION

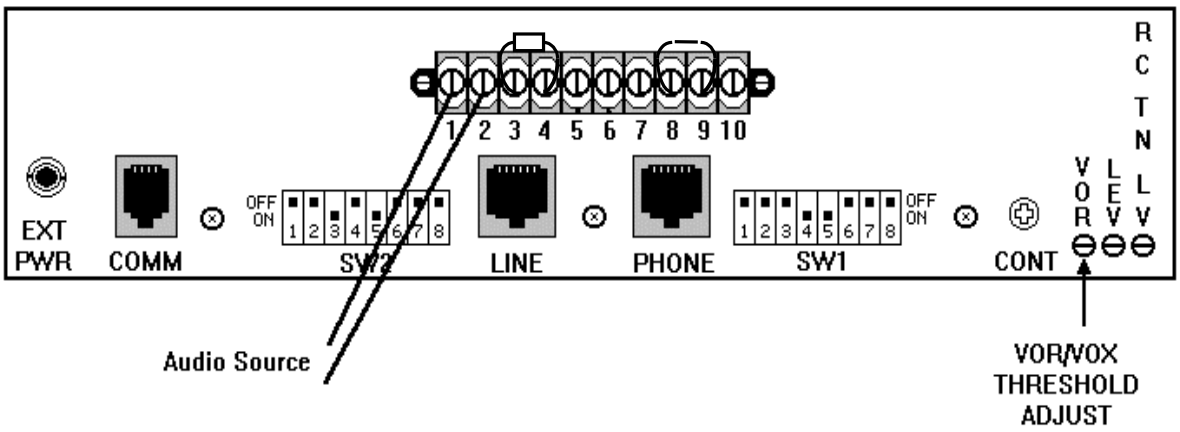


Figure 9: Console Rear Panel Connections for VOR/VOX Start

4.33 Generating Record Warning Tones

1) To generate Record Warning Tones, set SW1 Switch 8 to the ON position.
2) With SW1 Switch 6 in the OFF position the Record Warning Tone is maximum volume.
3) To decrease the volume of the Record Tone, on SW1 set Switch 6 to the ON position and adjust the un-labeled potentiometer on the rear panel for the desired level.

NOTE: *This tone is a half second "beep" occurring once every fifteen seconds (when the corresponding line is recording). The tone is transmitted on the secondary pair. In some instances, other recording equipment will already be generating this tone, if so, leave the VCR-2020 tone disabled. When the tone is used, the secondary pair must be the transmitting side of a four wire connection, or must be "jumpered" to the primary pair.*

4.34 Adjusting Gain

The VCR-2020 can be configured so that the receive pair (primary) is more sensitive than the transmit pair (secondary).

1) To Decrease the gain of the primary pair by 6 dB, set SW1, Switch 4 to the ON position.
2) To Decrease the gain of the secondary pair by 6dB, set SW1, Switch 5 to the ON position.

4.35 AGC (Automatic Gain Control)

In addition to the adjustable gain by 6 dB as described in Section 4.34 the VCR-2020 Console is equipped with an Automatic Gain Control. The AGC will take a large range of input signals (0 to -30dB) and amplify them to a standard RMS value.

1) To disable AGC, set SW2 Switch 1 to the ON position

NOTE: *The AGC range is not field adjustable!*

4.36 VCR-2020 Grounding

Typically added grounding of the unit is not required, however if a common ground connection with other equipment is required, this can be accessed at position 10 of the terminal block.

Warning:
Always refer to applicable local electrical code for approved methods of connection

5.00 INITIALIZATION

5.10 VCR-2020 INSTALLATION CHECKLIST

Prior to actual power-up and initialization, the VCR-2020 should be checked to avoid operational startup delays. Following is a convenient step-by-step checklist:

- ❑ Verify that the AC power cord is plugged into a live receptacle.
- ❑ Verify that all connectorized connections are plugged in securely and in the proper locations.
- ❑ Inspect all telephone or radio interface wiring for shorted wiring or improper polarity that would affect the VCR-2020 line interface.

5.20 VCR-2020 POWER UP SEQUENCE

The power up sequence involves the proper application of AC power (plugging in the power cord or transformer module if used) and switching the power ON. With a successful power up the Console displays should be on and the VCR-2020 is initialized as indicated by a header message on the Console display.

After viewing the initialization message the user should activate the Supervisor Mode by switching the key switch on any connected Console and do the following three programming steps. (refer to the User Reference Manual):

1. SET THE TIME
2. SET THE DATE
3. SET THE YEAR

If the VCR-2020 was properly connected to active lines, then it will begin recording as indicated on each Console.

APPENDIX

Appendix A: Reference Tables

A.1 SW1 Switch Group

Switch 1.. External Start (OFF)
Switch 2.. Voltage Level Start (OFF)
Switch 3.. Loop Current Start (OFF)
Switch 4.. Decrease Primary Gain (ON)
Switch 5.. Decrease Secondary Gain (ON)
Switch 6.. Reserved (OFF)
Switch 7.. Tone Level Adjust (OFF)
Switch 8.. Tone Enable (OFF)

A.2 SW2 Switch Group

Switch 1.. AGC Disable (OFF)
Switch 2.. Radio Enable (OFF)
Switch 3.. VOX ATTACK (Low Bit)
Switch 4.. VOX ATTACK (High Bit)
Switch 5.. VOX HOLD (High Bit)
Switch 6.. VOX HOLD (Mid Bit)
Switch 7.. VOX HOLD (Low Bit)
Switch 8.. ANI Disable (ON)

A.3 MAXIMUM CABLE LENGTH vs. WIRE GUAGE

The cables connecting the Server to the Console units also supplies the operating power. The wire guage used for this connection determines the maximum distance the Console unit can be installed from the server. Standard flat telephone cable is either 24 or 26 guage and is generally satisfactory. If the max cable length is exceeded, it may be necessary to use a separate power supply for the Console.

Wire Guage	Max Length
22 AWG	350 ft
24 AWG	225 ft
26 AWG	150 ft

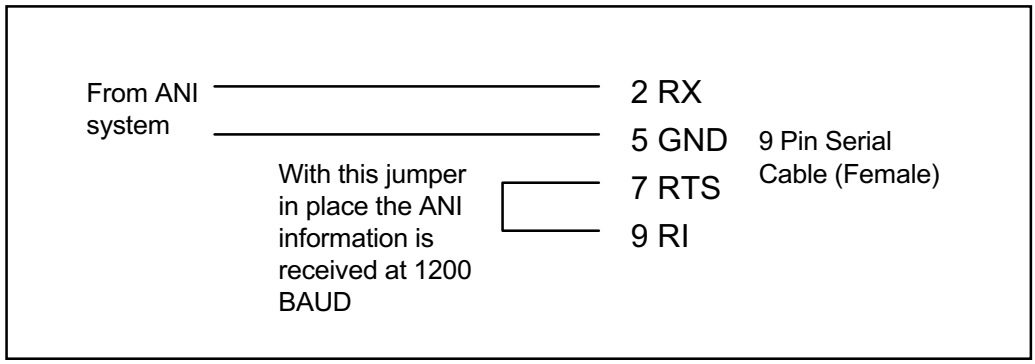
A.4 EXTERNAL POWER (IF REQUIRED)

External power to the VCR-2020 Console requires 12 VDC@ 1AMP through a standard low power connector (subminiature phone jack, tip positive).

APPENDIX

Appendix B: Serial Data Input for the VCR-2020

The VCR-2020 Server is equipped with two serial communications ports. Either port can be connected to either a Time Sync signal or and ANI data source. The typical serial cable connection is shown below. Note that each serial port will default to 9600 Baud unless the connection shown between pins 7 & 9 is made.



B.1 Time Synch

Two different time sync protocols are accepted by the VCR-2020. The first is a simple ASCII format found at some early PSAP installations. It has the format:

…… 'TTRhhmmssF'

where 'TTR' identifies the format, 'hh' is two hour digits, 'mm' is two minute digits, and 'ss' is two seconds digits. Leading zeros must be supplied. The 'F' is the final synchronizing character, when it is received, the time will be entered into the system clock.

The second protocol actually includes three variations (modes 0, 1, and 2) of the Spectracom formats.

ANI over a serial port is typically sent using 9600 BAUD. Some systems however transmit the ANI information at other BAUD rates. AS an Example AT&T uses 1200 BAUD.

Time synch is received at 9600 BAUD and is the default configuration.

APPENDIX

B.2 ANI Formats

The VCR-2020 Server also supports two formats of ANI data as detailed below. Note that the console number supplied must match the console actually recording the call, and the ANI string must arrive while the recording is in process in order for the ANI to be accepted and stored with the record.

ANI String Formats

A) 'ANIyynpannxdddde' Standard ANI string format

where:

ANI = Standard identification string
yy = Console number
npa = Area code
nnx = Local exchange number
dddd = Line number
e = end code (EOT = 04hex = ^D)

B) 'pnnxddddcctt' AT&T PSAP ANI format

where:

p = single digit npa code (9 or 0)
nnx = Local exchange number
dddd = Line number
cc = console ANI number
tt = trunk number