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**MODEL EAS 911  
EMERGENCY ALERT SYSTEM  
ENCODER/DECODER  
USER'S GUIDE**



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TFT INCORPORATED  
3090 OAKMEAD VILLAGE DRIVE  
SANTA CLARA, CA 95051-0862

P/N 5004-EAS911 REV. C

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SHIPMENT DATE \_\_\_\_\_

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EMERGENCY ALERT SYSTEM  
ENCODER/DECODER  
USER'S GUIDE**



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## EAS 911 EAS ENCODER/DECODER

The EAS 911 is a combined Emergency Alert System (EAS) Encoder and Decoder that permits broadcasters, cablecasters and emergency managers to receive, store, forward, and originate Emergency Alert Messages prescribed by the FCC's new EAS Rules. By using the new EAS digital protocol, the Decoder responds only to the user pre-selected messages and forwards only certain messages automatically with no operator intervention. The Encoder generates all the EAS header codes to initiate both alert and test messages.

### FEATURES:

- Low Cost, Easy EAS Decoder and Encoder in Single Unit
- Fully Compliant with FCC Part 11, Emergency Alert System Rules
- Fully Compatible with NOAA Weather Radio SAME Code
- Scans 2 Required Audio Inputs Expandable to Four Inputs
- Two RS-232 Interfaces (Expandable to six)
- Full Features for Unattended Operation.
- Front Panel Logging Printer
- Built-in Two-Minute Digital Voice Storage
- Interface for Video Character Generator and RBDS Generator Available (Optional)
- Provision for Optional External LED Message Signs
- FCC ID No. BIOEAS911

### FIELD INSTALLABLE OPTIONS

*Audio Input Expander* This field installable plug-in card allows two additional audio channels to be scanned by the Decoder in EAS 911.

*Four-Port COM Expander* This plug-in card expands the capabilities of the EAS 911 to interface with a variety of special purpose external devices via RS232 connections. It is a standard item in EAS 911T, optional for other models. The COM Expander consists of four special purpose communication ports.

The COM1 port supports an RS-232 interface to a PC at user selectable data rates. The interface permits control of the EAS Model 911 front panel functions from a PC.

The COM2 port exchanges serial data to and from an external video character generator using an RS-232 interface. Protocols for several major suppliers of character generators are supported.

The COM3 port is another RS-232 interface for the expansion of the EAS 911 front panel's EVENT and LOCATION(S) keys.

The COM4 port is a 2-pin interface for a pair of twisted wires to drive remote LED message signs via a serial data buss.

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# SECTION I

## GENERAL INFORMATION

### 1.1 INTRODUCTION

This EAS 911 User's Guide is arranged in seven sections, as follows:

#### **Section I: INTRODUCTION**

A general description of the EAS 911, its specifications, general information on the FCC designator, warranty and damage claim procedures, and technical support information.

#### **Section II Getting To Know Your EAS 911 and Related Equipment**

Overview of the various system components of the EAS 911 and related equipment. Control and Indicator functions, basic component functions, and their interconnection.

#### **Section III: Pre-Installation Checkout**

Some basic test methodology on the EAS 911 and its related equipment. The user should find it useful to perform the tests in this section with all the EAS 911 equipment on a lab bench.

#### **Section IV: Programming The EAS 911**

Detailed description of setup procedures of various EAS 911 system parameters, e.g. system date and time, station ORG and FIPS codes, Auto Forward events and locations selection, as well as enabling of optional features.

#### **Section V: Installation**

Instruction for installing and adjusting various system components of the EAS 911.

#### **Section VI: Operation**

Describes operational details of the system, including procedures to encode and decode an EAS message.

#### **Section VII: Maintenance and Repair**

Describes routine maintenance procedures and tools and equipment requirements.

### 1.2 EQUIPMENT DESCRIPTION

The EAS 911 is a combined Emergency Alert System (EAS) Encoder and Decoder that enables broadcasters and cablecasters to receive, store, forward, and originate Emergency Alert Messages as required by the FCC's new EAS Rules. By using the new EAS digital protocol prescribed by the FCC, the EAS 911 can function as a sentinel to alert operators to the receipt of emergency messages. Forwarding of only certain messages with a minimum of operator intervention can be achieved selectively, simply, and automatically.

The Encoder section of the EAS 911 is easily programmed to originate emergency alerts in the proper EAS protocol for specific geographic areas as small as one-ninth of an ordinary county. Although the EAS 911 Decoder stores all received messages, it only forwards and interrupts programming for those messages that meet broadcasters' or cablecasters' specific instructions. These instructions, protected by three levels of security, relieve the operator of needing to make crucial decisions at critical times. Operators are guided by the EAS 911 Encoder section front panel layout to program event codes and locations. Emergency messages can then travel quickly and efficiently through the Emergency Alert System.

The EAS 911 has two operating modes: automatic and manual. In automatic mode, only those messages which meet specific criteria are forwarded to the transmitter. With the exception of the required national level events, only messages "tagged" by management are allowed to interrupt programming. For minimal or unattended operation, the EAS 911 can perform all the critical emergency alert functions in automatic mode with the optional voice recorder option without operator assistance. For manual mode, no messages are forwarded, except for required national level messages, unless sent by an operator. All incoming messages are recorded, and their header information is stored and available for review or subsequent manual forwarding.

An optional digital voice message recording unit makes an incoming audio message of up to two minutes always available for the operator's immediate review. The operator can then decide whether to forward the last message received after review of the complete header and voice announcement. With the EAS 911 voice recorder option it is not necessary

for the operator to transcribe or remember text. An LCD display gives the operator instant access to the last ten messages either received or sent. The optional digital voice message recorder allows automatic forwarding.

Two audio inputs and one RS-232 data input are standard on the EAS 911 to connect to receivers for the two required monitoring assignments of the new EAS. An optional board will provide another two audio inputs for a total of four.

A single audio output connects to external audio switching and distribution systems or to an optional TFT transmitter/program interrupt unit. This optional interrupt unit provides four balanced, isolated input and output channels that are switched to a combined common signal during an emergency message transmission. The common audio output provided by the EAS 911 contains all the header, Attention Signal and EOM codes in proper EAS format for emergency alerting.

### 1.3 SPECIFICATIONS

The EAS 911 performance and physical specifications are listed in Table 1.3-1.

**Table 1.3-1. EAS 911 Specifications**

#### ENCODER SECTION

Protocol .....	FCC EAS codes, 520.83 bits per second. 2083.3 Hz mark and 1562.5 Hz space frequency, ASCII 8-bit characters.
Attention Signal .....	853 and 960 Hz ±5 Hz. User programmable duration
PASSWORD Key .....	Enables 3-digit password entry for operator level . Additional 3-digit password required for program changes.
CANCEL Key .....	Interrupts operation in progress and returns system to Banner mode.
HELP Key .....	Prints out operational help and program menus.
PRACTICE Key .....	Allows closed-loop self-test for training and unit performance verification.
SEND HEADER Key .....	Activates transmit relay and sends pre-constructed header message
SEND EOM Key .....	Activates transmit relay and sends End Of Message code
EVENT Keys .....	16 keys for user-assigned events
WEEKLY TEST Key .....	Allows the EAS routine weekly test to be generated with a minimum of keystrokes
LOCATION(S) Keys .....	14-key for user-assigned locations
SUBDIVISION Keys .....	Allows selection of 9 subdivisions within a county
DURATION Keys .....	User-entered duration of the event in prescribed interval
CONFIRM Key .....	Confirms completion of each step in encoder programming
ON-AIR RELAY LED .....	Indicate a key switch is energized

#### DECODER SECTION

REVIEW Key .....	Allows review of last message received
LED Indicators .....	5 yellow LEDs to indicate incoming EAS channel, four analog and one digital. Two yellow LEDs to indicate AUTO or MANUAL mode of operation and one red LED to show status of the ALERT relay completion of each step in encoder programming

## OPERATION KEYS

- SPEAKER Key .....Turns speaker ON and OFF; monitors inputs
- PRINT Key .....Commands the front panel printer to print the item shown on the LCD Screen
- ENTER, EXIT, UP .....Assist initial setup and programming of the equipment  
and DOWN Keys

## REAR PANEL

- Audio Inputs .....Two audio channels for FCC EAS or NOAA SAME protocol. Balanced or unbalanced, 10 k-ohms, .35 Vp-p to 2 Vp-p. Expandable to 6 channels
- Data Channels .....RS-232, 1200 baud ASCII, one for input, and one for output
- Audio Output .....-10 to +10 dBm, 600-ohm balanced, XLR connector
- On-Air Relay .....Relay contact closure, energized when a selected message is decoded for automatic forwarding or when the Encoder is activated
- Message Alert Relay .....Relay contact closure, energized when an EAS message is decoded
- RS-285 .....Twisted pair wiring connection for the remote status and control board
- Printer/Speaker Inhibit .....Connects to external switch or relay contacts. Normal operation on contact open. Printing and Speaker operation inhibited (muted) on contact closure
- 60 Hz Clock Reference .....Connects to external 60 Hz, 9 VAC for clock synchronization
- COM1, COM2, COM3 .....Optional features when the COM Port Expander is installed  
and COM4

## MECHANICAL AND ENVIRONMENTAL

- Input Power .....117 VAC  $\pm$ 10%, 60Hz, 40 watts maximum.
- Operating Temperature .....0 °C to 50 °C
- Size .....3.5" x19" x16"
- Net Weight.....Approximately 12 lbs.
- Shipping Weight .....Approximately 14 lbs.

## 1.4 FCC DESIGNATOR

The EAS 911 Emergency Alert System Encoder/Decoder is Type-Certified under FCC Part 15, and Type-Certified under Part 11. The FCC designator is BIOEAS 911.

## 1.5 WARRANTY INFORMATION

The following warranty policy and limitations are applicable to the Model EAS 911 Emergency Alert System Encoder/Decoder.

TFT, Inc. warrants each manufactured Model EAS 911 Emergency Alert System Encoder/Decoder to meet published specifications and to be free from defects in material and workmanship. TFT will repair or replace, at its expense, for a period of one (1) year from the date of shipment of equipment, all parts which are defective from faulty material or workmanship. This Warranty does not cover equipment which has been misused and/or altered by the user. Units found to be defective during the warranty period shall be returned to TFT with transportation charges prepaid by the BUYER. It is expressly agreed that replacement and repair shall be the sole remedy of the SELLER with respect to any non-conforming equipment and parts thereof, and shall be in lieu of any other remedy available by applicable law. All returns to the factory must be authorized in advance by TFT. Upon examination by the factory, if any EAS 911 Equipment is found to be defective, the unit will be repaired and returned to the BUYER with transportation charges prepaid by TFT during the warranty period. Transportation charges for the Encoder and Decoder units found to be defective within the first 30 days of the warranty period will be paid both ways by TFT. Transportation charges for warranty returns wherein failure is found not to be the fault of TFT or one year after the delivery of the equipment shall be paid both ways by the BUYER. This warranty does not apply to equipment which, in the opinion of the SELLER, has been altered or misused.

## **1.5 WARRANTY INFORMATION (Continued)**

**NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. TFT IS NOT LIABLE FOR ANY CONSEQUENTIAL DAMAGES.**

## **1.6 CLAIMS FOR DAMAGE IN SHIPMENT**

Your instrument should be inspected and tested by the method given in Section II of this manual as soon as it is received. If the instrument is damaged in any way or fails to operate properly due to transportation damage, file a claim with the carrier or, if insured separately, with the insurance company.

## **1.7 TECHNICAL SUPPORT**

**OUR CUSTOMER SERVICE FOR EAS PRODUCTS IS AVAILABLE FROM 8:00AM TO 5:00PM PACIFIC TIME MONDAY THROUGH FRIDAY. PLEASE CONTACT US IF YOU NEED ASSISTANCE**

### **TFT, Inc.**

3090 Oakmead Village Drive  
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## SECTION II

### GETTING TO KNOW YOUR EAS 911 AND RELATED EQUIPMENT

#### 2.1 INTRODUCTION

This section provides an overview description of the EAS 911 equipment including Front Panel controls and indicators, Rear Panel connectors, options and other related peripheral equipment.

#### 2.2 UNPACKING & INSPECTION

Upon receiving the equipment, inspect its shipping container and contents for shipping damage. Keep all packing material until equipment performance is confirmed.

If any of the equipment is damaged or fails to operate properly due to transportation damage, file a claim with the transportation company or, if insured separately, with the insurance company.

The following items should come with the equipment. Please notify TFT if any items are missing.

Description	Part No	Qty
Installation and Operation Guide	5004-EAS911	1
Power Cord	1950-7742	1
AC to AC transformer	1500-81B5	1
Warranty Notice	3002-0002	1
Warranty Card	3001-0420	1
2-PIN Female Terminal Block Connector	1700-1203	4
6-PIN Female Terminal Block Connector	1700-5007	2
EVENT Card	3001-0760	2
LOCATION Card	3001-0761	2

#### 2.3 THE FRONT PANEL

The EAS 911 Front Panel is a collection of input switches and output LEDs, LCD screen, and Printer. Functionally they are grouped into two categories as illustrated in Figure 2.3.1 and 2.3.2 and described in paragraphs 2.3.1 and 2.3.2.

##### 2.3.1 Encoder Section

Encoder controls and indicators are located on the left half of the Front Panel. They include all the command keys as well as the 16 encoder event and 14 location keys. Detailed description on the usage and operation of the keys can be found in this Section.

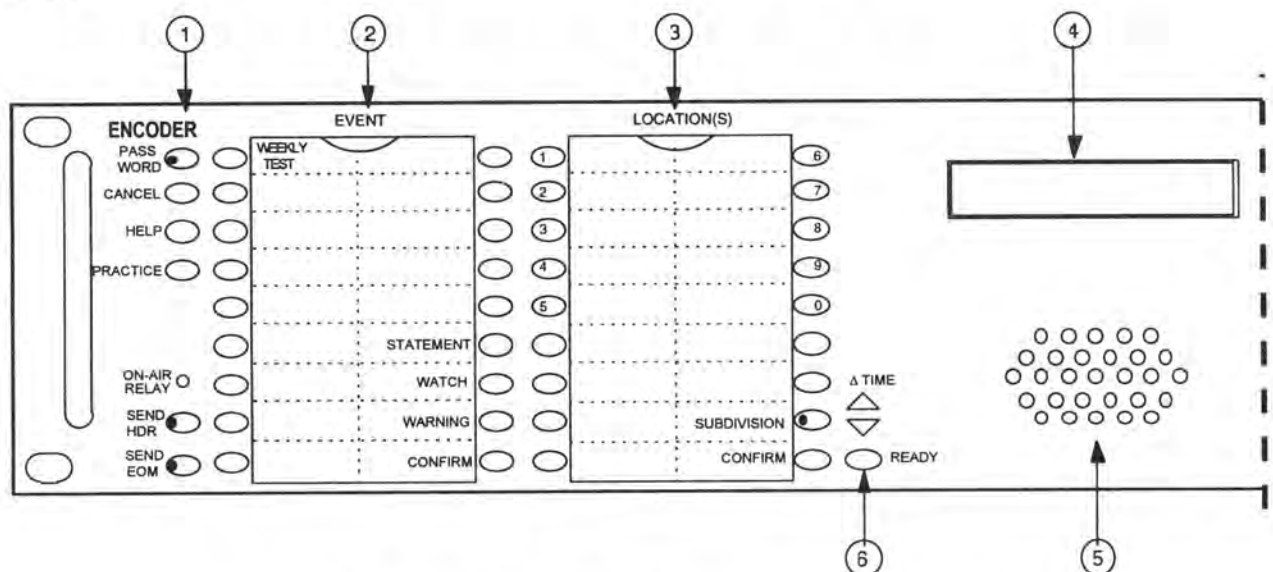


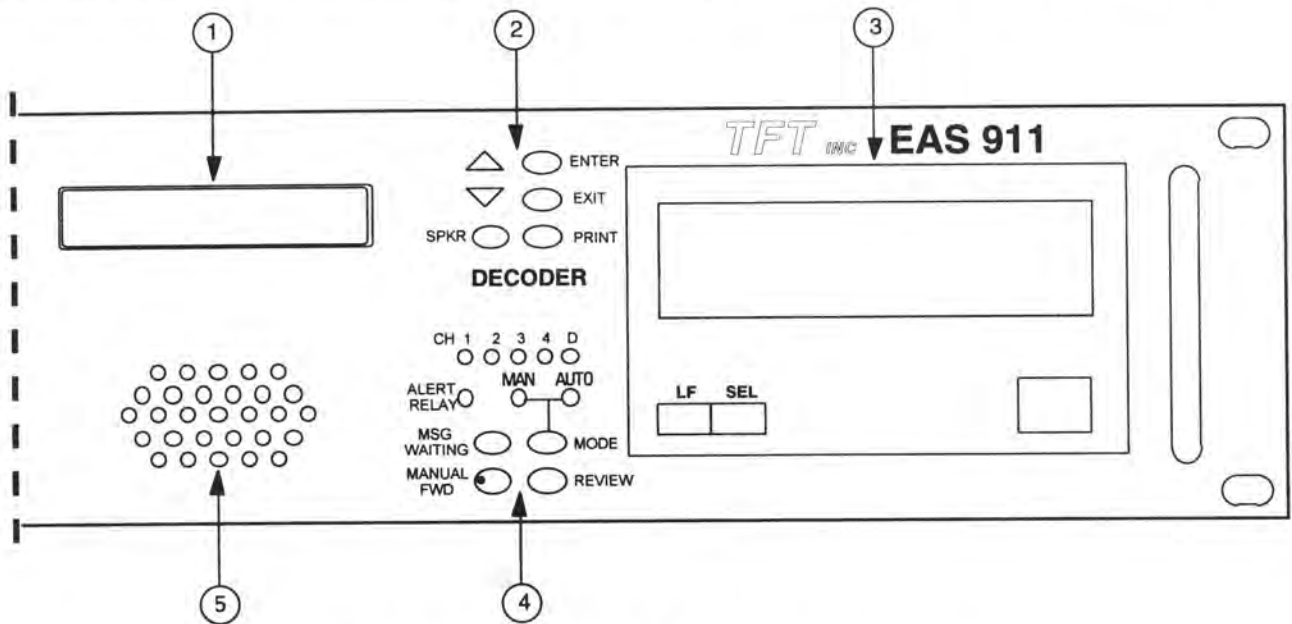
Figure 2.3-1. Encoder Controls and Indicators

**Table 2.3-1. Encoder Controls and Indicators**

ITEM	TITLE	FUNCTION
1	<p>ENCODER</p> <p>PASSWORD</p> <p>CANCEL</p> <p>HELP</p> <p>PRACTICE</p> <p>ON-AIR RELAY</p> <p>SEND HDR (Send Header)</p> <p>SEND EOM</p>	<p style="text-align: center;"><b>Note:</b></p> <p>All EAS 911 switches are momentary action pushbutton type, and are referred to as keys. All keys have built-in yellow LED illuminators. Some keys are electronically aided to function as toggles or latches.</p> <p>A group of keys and indicators used for control of Encoder portion of the EAS 911.</p> <p>Key. Used to access the Encoder Operational Mode and the Setup Menu.</p> <p>Key. May be used to clear inputs or return to a previous entry mode. During transmission of encoded or manually forwarded messages, pressing CANCEL deactivates the ON-AIR relay and aborts message transmission.</p> <p>Key. Provides access to help menus in Ready, Operation and Setup modes.</p> <p>Key. Prevents the ON-AIR relay from being activated so that message encoding and decoding operations may be practiced without on-air program interruption.</p> <p>LED Indicator. illuminated whenever the ON-AIR relay is activated.</p> <p>Key. When flashing, activates the ON-AIR relay and sends the programmed or repeated EAS header information.</p> <p>Key. When flashing, SEND EOM activates the ON-AIR relay and sends the EAS End Of Message code.</p>
2	<p>EVENT</p> <p>WEEKLY TEST</p> <p>STATEMENT</p> <p>WATCH</p> <p>WARNING</p>	<p>A group of 16 keys. These keys may be assigned EAS event codes or event templates relevant to a station's broadcast area. The required WEEKLY TEST is pre-programmed.</p> <p>Initiates weekly test.</p> <p>Selects a STATEMENT EAS event code when an event template has been assigned to an event key.</p> <p>Selects a WATCH EAS event code when an event template has been assigned to an EVENT key.</p> <p>Selects a WARNING EAS event code when an event template has been assigned to an EVENT key.</p>
3	<p>EVENT READY</p> <p>LOCATION(S)</p> <p>1 to 0 Numeric Keys</p> <p>SUBDIVISION</p> <p>CONFIRM (Location Ready)</p>	<p>Encodes a selected event.</p> <p>A group of 19 keys for entering LOCATIONS and setting time. Locations are specified using Federal Information Processing System (FIPS) codes. Counties, states, or groups of counties and states in a station's broadcast area can be assigned to each location key.</p> <p>Used for setup, programming and entering passwords</p> <p>Assigns 1 to 9 subdivisions to a county assigned to a LOCATION key.</p> <p>Confirms the selected locations</p>
4	<p>LCD Screen</p>	<p>16-character by 1-line LCD display screen. Displays date, time, header, setup, and help information.</p>
5	<p>Speaker</p>	<p>Speaker. Outputs the inputs and Header, Message, and End of Message (EOM) audio.</p>
6	<p>READY (Time Ready)</p> <p>Δ TIME (Δ ∇)</p>	<p>Encodes the duration of an alert displayed on the LCD screen</p> <p>Arrow keys. The duration of an alert is incremented (Δ) or decremented (∇) each time a key is pressed.</p>

### 2.3.2 Decoder Section

Decoder keys and LEDs are located on the right half of the Front Panel. They include the command keys/LEDs, the LCD Display Screen and the Printer. Detailed descriptions of the usage and operation of the keys are contained in Table 2.3-2.



**Figure 2.3-2. Decoder Controls and Indicators**

**Table 2.3-2. Decoder Controls and Indicators**

ITEM	TITLE	FUNCTION
1		16-character by 1-line LCD display screen. Displays date, time, header, setup, and help information. Displayed data scrolls right to left to accommodate messages longer than 16 characters.
2	ENTER	A group of six keys with functions as marked Selects menu items displayed on the LCD screen, and is used in Encoder and Decoder operations.
	EXIT	Exits the current menu and returns to the previous menu or Ready mode. If pressed while in Banner Mode (Time/Date Display), displays software version. If pressed and held for several seconds, causes the software to execute a POWER UP RESET sequence.
	PRINT	Causes the item displayed on the LCD Screen to print out on the optional front panel printer.
	Δ	Arrow or Increment/Decrement keys. The Increment key (Δ) scrolls upward through menus, or when the SPEAKER key is pressed, increases the speaker volume.
	∇	
	THIS THIS THIS THIS	The decrement key (∇) scrolls downward through menus, or when the SPEAKER key is pressed, decreases the speaker volume.
	SPKR	When pressed, activates the speaker on Channel 1. Each time the key is pressed, it advances the speaker to the next channel.
3		Optional 24-column printer. Produces hard copy of EAS messages and Program and Help menus.
4	MSG WAITING	A group of four keys and six LEDs which function as marked: Key. This key begins flashing when a valid EAS message has been received. The message will scroll on the LCD Screen and remote electronic signs.

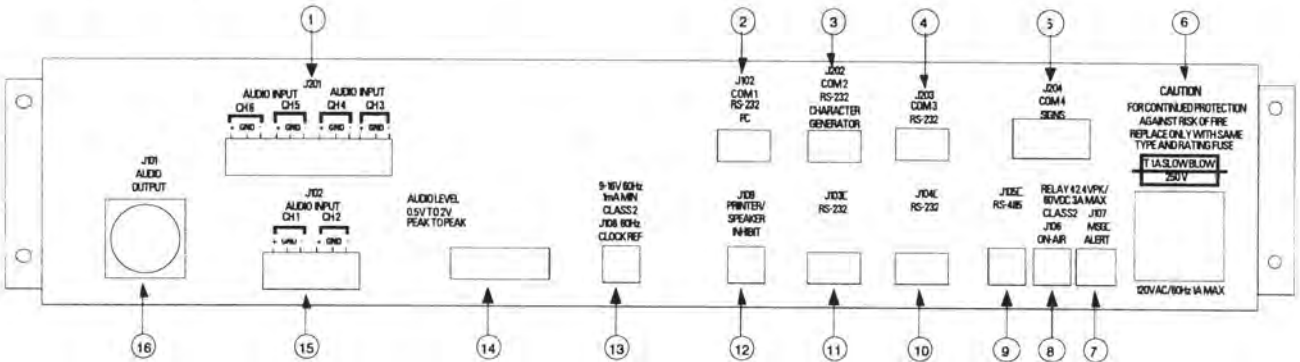


**Table 2.3-2. Decoder Controls and Indicators**

ITEM	TITLE	FUNCTION
5	MODE	Key. Each time key is pressed, the EAS 911 operating mode toggles between Manual and Auto. (with password protection)
	MANUAL FWD	Pressing this key in conjunction with the PASSWORD key, forwards the last EAS messages received when in Ready mode.
	CH 1, 2, 3, 4, D	A group of five LED indicators. Channel 1 to 4 audio activity LEDs turn on if the channel input level exceeds -10 dBm. The D LED indicates receipt of data on the RS-232 channels.
	ALERT RELAY	LED indicator. Lights, and the rear panel Alert Relay contacts close when a valid EAS message is received.
	MAN , AUTO	Two LED indicators which light to show the current operating mode (Manual or Automatic). When the AUTO LED is lit, the unit will automatically forward messages for events and locations specified in the Setup Menu. FCC-mandated Priority EAS messages will be forwarded regardless of the operating mode.  Speaker. Provides aural output of Inputs and Header, Message, and End of Message (EOM) audio.

**2.4 THE REAR PANEL**

The EAS 911 Rear Panel has Input/Output connectors for EAS related or optional equipment. Figure 2.3-3 shows the Rear Panel Configuration.



**Figure 2.3-3. Rear Panel Connectors**

**Table 2.3-3. Rear Panel Connectors**

ITEM	TITLE	FUNCTION
1	J201 CH 3, 4 AUDIO INPUT	6-pin connector on the optional Audio Input Expander. Provides two balanced inputs for audio from EAS sources.
2	COM 1 RS-232 PC	9-pin D-connector on the optional 4-port Expander Board. Provides an RS-232 port for use as a remote interface.
3	COM 2 RS-232	9-pin D-connector on the optional 4-Port Expander Board. Provides an RS-232 port for use as a character generator interface.
4	COM 3 RS-232	9-pin D-connector on the optional 4-Port Expander Board. Provides an RS-232 port for future external devices.

**Table 2.3-3. Rear Panel Connectors (Continued)**

ITEM	TITLE	FUNCTION
5	COM 4 SIGNS	9-pin D-connector on the optional 4-Port Expander Board. Provides a twisted-pair RS-232 interface to drive remote electronic signs.
6	120VAC/60 Hz FUSE: 2A	Recessed IEC connector with built-in fuse holder for a standard U.S. 120 VAC, 60 Hz line cord.
7	J107 MSG ALERT RELAY	2-wire relay contact. Relay is normally open. Relay contacts close when a valid EAS message header is decoded.
8	ON-AIR RELAY	2-wire relay contact. Relay is normally open. Relay contacts close when an EAS message is transmitted.
9	RS-485	Bi-directional balanced RS-485 port for an optional TFT EAS 941 Remote Status & Control Module interface.
10	J104 RS-232	9-pin D-connector. Provides a bi-directional RS-232 port for data output at 1200 baud.
11	J103 RS-232	9-pin D-connector. Provides a bi-directional RS-232 port for data input at 1200 baud.
12	J109 PRINTER/SPEAKER INHIBIT	2-pin connector. Provided to inhibit the printer and mute the speaker.
13	J108 60 Hz CLOCK REF	Connector jack. Provides for an external 60 Hz reference clock input.
14	SERIAL NO. & ID	TFT model and serial number and FCC ID for compliance with Parts 11 and 15.
15	J102 CH1, 2 AUDIO INPUT	6-pin connector. Provides two balanced audio inputs for audio from EAS sources.
16	J101 AUDIO OUTPUT	3-conductor male XLR connector. Provides balanced audio output for transmission of EAS messages.

## 2.5 OPTIONS

There are four options available for the EAS 911 Encoder/Decoder:

- Digital Voice Recorder
- Audio Input Expander
- 4-Port Comm Expander and
- Printer.

The following paragraphs describe these options in detail.

### 2.5.1 Digital Voice Recorder, Option 01

The optional plug-in voice recorder is a field-installable card. The last incoming EAS audio message, (up to two minutes) is always available for the operator's immediate review. The operator can then decide whether to forward the last message received after review of the complete header and voice announcement. With the EAS 911 voice recorder option, it is not necessary for the operator to transcribe or remember text script. The optional digital voice message recorder also allows automatic forwarding of the voice message without using an external recording device.

In addition, the voice recorder can be set up to provide a user-recorded announcement after the required two tone attention signal. This requires an initial setup to record a customized announcement by the user.

The Digital Voice Recorder Option is a standard Component in Models EAS 911R and EAS 911T.

### 2.5.2 Audio Input Expander, Option 02

The optional Audio Expander board can be plugged into the EAS 911 Main PCB J112 Connector. It provides two additional audio inputs the EAS 911 for a total of 4 channels. Each channel is simultaneously and continuously monitored for EAS messages.

### **2.5.3 4-Port Comm Expander, Option 03**

The optional 4-Port Comm Expander can be field installed into the EAS 911 main PCB J113 connector. It provides communication links to the following EAS 911 related equipment.

### **2.5.4 Printer, Option 04**

A 24-column printer is provided to record EAS messages received and transmitted. In addition, it is useful for printing HELP menus. The printer can also be used as a helpful training tool when used with the PRACTICE key to assist in the proper encoding of messages.

## **2.6 RELATED EQUIPMENT**

The EAS 911 can accommodate various external equipment to comprise a complete Emergency Alert System. Some of this equipment is described in the following paragraphs.

### **2.6.1 TFT EAS 930 Multi-Module Receiver**

The TFT Model 930 Receiver System is a separate, 1-3/4" rack-mount chassis. It can accommodate up to four different plug-in receiver types:

- AM
- FM
- NOAA Weather Radio
- (Spare)

These receivers can be used as sources for the EAS 911 audio inputs. This allows a user to plug up to four different receivers into the chassis, then connect them to the EAS 911. There is one output per receiver. A separate data sheet is available for the TFT EAS 930 receiver.

### **2.6.2 TFT EAS 940 Program/Transmitter Interrupt Unit**

The TFT Model EAS 940 Program transmitter Interrupt unit interrupts a station's audio program to insert an EAS Header and voice message. Normal program audio is resumed at the conclusion of the message.

The EAS 940 has four program inputs, an EAS audio input and four program outputs. During an EAS alert, the EAS audio is routed to all four program outputs. It uses internal audio relays, and it connects to ON-AIR relay contacts J106 and audio output J101 on the EAS 911 rear panel. The EAS 940 can be located up to 2,000 feet from the EAS 911.

### **2.6.3 TFT EAS 941 Remote Control/Status Module**

The EAS 941 Remote Control/Status Module allows the operation of the EAS 911 at a remote location. It duplicates certain major functions of the EAS 911 front panel. Interfacing via RS485 single twisted pair wiring to the EAS 911, the EAS 941 may be located at distances up to 2000 feet.

## **2.7 PRE-INSTALLATION INFORMATION**

Before installing your TFT EAS 911, you should be familiar with the requirements of Part 11 of the FCC rules. The TFT EAS Handbook includes a complete set of these rules along with helpful diagrams.

### **2.7.1 Obtaining A Copy of the Operational Area/State Plan**

The TFT EAS 911 is very flexible and can be adapted to your Operational Area/State Plan. To obtain a copy of the plan, contact your State's Emergency Coordinator or the broadcast representative for your operational area. Names of State and local contacts are available from the FCC EAS office in Washington, D.C.

### **2.7.2 Obtaining Two FCC-Assigned Stations to Monitor**

The New EAS requires monitoring two stations in your area. These stations are listed in the operational Area/State Plan and in the FCC Mapbook, which is also available from the FCC EAS office in Washington, D.C. In most, but not all cases, the FCC assigned stations will be AM or FM broadcast stations.

### **2.7.3 Optional/Additional Monitoring**

In addition to the FCC assigned stations it may be desirable to monitor other sources and originators of emergency information who may transmit EAS protocol messages, such as NOAA Weather Radio and local government authorities.

## **2.8 INSTALLATION SUMMARY FORM**

Completing the information on the following work sheets before programming the EAS 911 will greatly reduce the time required to program the Encoder/Decoder during the initial setup.

INSTALLATION SUMMARY SHEET

- 2.8.1 FCC Monitoring Assignment, CH 1 \_\_\_\_\_ (Station) \_\_\_\_\_ (Frequency)
- 2.8.2 FCC Monitoring Assignment, CH 2 \_\_\_\_\_ (Station) \_\_\_\_\_ (Frequency)
- 2.8.3 FCC Monitoring Assignment, CH 3 \_\_\_\_\_ (Station) \_\_\_\_\_ (Frequency)
- 2.8.4 FCC Monitoring Assignment, CH 4 \_\_\_\_\_ (Station) \_\_\_\_\_ (Frequency)

2.8.5 My Station's Originator Code:

- EAN Emergency Action Notification Network (Restricted)
- Primary Entry Point System (Restricted)
- National Weather Service
- Civil authorities
- Broadcast Station or cable system

2.8.6 My Station's FIPS Code: \_ \_ \_ \_ \_

2.8.7 My Station's ID: \_ \_ \_ \_ \_

2.8.8 Time Zone of my station \_\_\_\_\_  
Zone Hours to UTC - GMT

2.8.9 Front Panel "EVENT" Key Assignments (type key assignments on slide-in Event card):

**Note:** The card may be easily removed from the holder by using a folded piece of paper to push the card up from the bottom opening slot of the holder. Three folds approximately .1 inch wide should be sufficient.

- |                     |                      |
|---------------------|----------------------|
| 1. _____<br>(Event) | 2. _____<br>(Event)  |
| 3. _____<br>(Event) | 4. _____<br>(Event)  |
| 5. _____<br>(Event) | 6. _____<br>(Event)  |
| 7. _____<br>(Event) | 8. _____<br>(Event)  |
| 9. _____<br>(Event) | 10. _____<br>(Event) |

2.8.10 Events to Auto Forward:

- |               |               |
|---------------|---------------|
| _____ (Event) | _____ (Event) |
| _____ (Event) | _____ (Event) |
| _____ (Event) | _____ (Event) |

## INSTALLATION SUMMARY SHEET (Continued)

2.8.11 Front Panel LOCATION Key Assignments(type key assignments on slide-in Location card):

**Note:** The card may be easily removed from the holder by using a folded piece of paper to push the card up from the bottom opening slot of the holder. Three folds approximately .1 inch wide should be sufficient.

1	(Description)	(FIPS)	7	(Description)	(FIPS)
2	(Description)	(FIPS)	8	(Description)	(FIPS)
3	(Description)	(FIPS)	9	(Description)	(FIPS)
4	(Description)	(FIPS)	10	(Description)	(FIPS)
5	(Description)	(FIPS)	11	(Description)	(FIPS)
6	(Description)	(FIPS)	12	(Description)	(FIPS)

2.8.12 Locations to Auto Forward:

(Name)	(FIPS)
(Name)	(FIPS)
(Name)	(FIPS)
(Your State)	(OSS000)
USA	000000

## SECTION III

### PRE-INSTALLATION CHECKOUT

#### 3.1 INTRODUCTION

This section describes a functional bench test to be performed before installing and programming the EAS 911 according to the procedures given in Section IV. By completing the pre-installation checkout, the user can be certain that the equipment is operating properly.

#### 3.2 PRIMARY POWER APPLICATION

When power is applied to the EAS 911, the front panel LEDs may blink momentarily, the LEDs will extinguish, and the Liquid Crystal Display (LCD) Screen will show the date and time. The EAS 911 will be in the Ready Mode, monitoring the audio inputs for incoming EAS messages.

#### 3.3 ENCODER TO DECODER SELF TEST

The EAS 911 Encoder and Decoder functions can be tested by connecting the Audio out at J101 of the Rear Panel to Audio Input J102 with a XLR out to 3 pin AUDIO INPUT cable.

Press the following keys: PASSWORD, 9,1,1, WEEKLY TEST, READY, SEND HDR. The ON-AIR RELAY LED will light, the LCD Screen will display "**SENDING HEADER**", and the header audio will be heard through the speaker. The LCD Screen will then display "**SEND EOM**", and the printer will print the EAS message if it is installed.

Press the SEND EOM key. The LCD will display "**SENDING EOM**", then send the EOM message. Press the MSG WAITING key. The EAS 911 will return to the Ready (Decode) Mode.

#### 3.4 TEST WITH ANCILLARY EQUIPMENT

##### 3.4.1 Test With EAS 930 Multi-Module Receiver

Connect the Audio Output of the EAS 930 Multi-Module Receiver to the EAS 911 Channel 1 Audio Input at J102 of the EAS 911 Rear Panel. Press the SPKR key and listen to the EAS 930 broadcast Audio Output through the EAS 911 speaker.

At this time it may be convenient to set the audio input levels to the EAS 911. Use an oscilloscope or audio voltmeter to set the input voltages to approximately 1.5 Volt peak-to-peak.

##### 3.4.2 Test with EAS 940 Program/Transmitter Interrupt Unit

Refer to the instructions for the EAS 940 Program/Transmitter Interrupt Unit.

##### 3.4.3 Test with EAS 941 Remote Control Status Module

Refer to the instructions for the EAS 941 Remote Control/Status Module

#### 3.5 TESTING THE PRINTER

The optional printer (standard on the EAS 911R or EAS 911T) can be tested by pressing the PRINT key on the EAS 911 front panel. The 24-column printer will print out the text displayed on the LCD.

#### 3.6 TESTING THE DIGITAL VOICE RECORDER

Connect the EAS 930 Multi-Module Receiver or any other audio source to the EAS 911 Channel 1 Audio Input at J102 of the EAS 911 Rear Panel.

Enter the primary and setup passwords by pressing the following Front Panel keys: PASSWORD, 9, 1, 1, PASSWORD, 9, 1, 2. Press the Arrow keys until the LCD Screen displays "**21 RECORD—**". Press ENTER twice to start the Digital Voice Recorder recording.

Press EXIT after recording is completed. The Digital Voice Recorder immediately plays back the announcement that was just recorded. Press EXIT to exit.

The Digital Voice Recorder is a standard component in Model EAS 911T and EAS 911R

### **3.7 TESTING WITH A VIDEO CHARACTER GENERATOR**

See the Character Generator operation manual.

### **3.8 TESTING WITH A MOVING MESSAGE SIGN**

Connect the 2-wire interface cable of the Moving Message Sign to the J304 connector at the Rear Panel of the EAS 911. Enable the EAS 911 Remote sign option by following the instructions outlined in section 4.20 of this Guide, and ensure the power supply for the sign is turned on.

Perform the Required Weekly Test as described in section 3.3, Encoder-to-Decoder Self Test. The EAS message will be displayed on the Moving Message Sign.

## SECTION IV

### PROGRAMMING THE EAS 911

#### 4.1 INTRODUCTION

The EAS 911 can be programmed to customize its configuration and to automate its operation. EAS 911 programming techniques are described in this section.

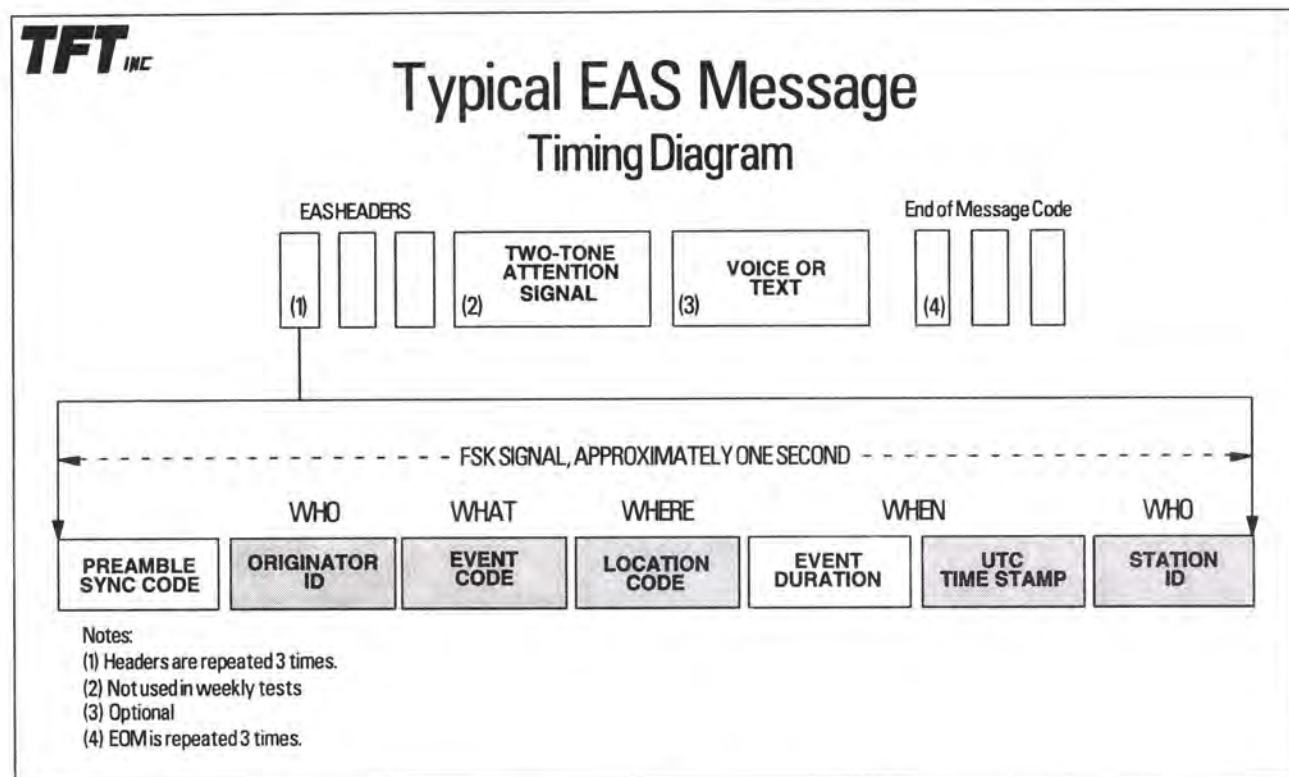
#### 4.2 EAS MESSAGE OVERVIEW

A four-part message is used to activate the Emergency Alert System:

1. Preamble and EAS Header Codes
2. Two-tone audio Attention Signal\*
3. Voice or text message\*
4. Preamble and EAS End Of Message (EOM) Codes.

\* Not used in the required weekly tests.

The message is shown pictorially in Figure 4.2-1.



**Figure 4.2-1 EAS Message Timing Diagram**

The Preamble and EAS Header Codes are transmitted using Frequency Shift Keying (FSK) at a rate of 520.83 bits per second. Mark frequency is 2083.3 Hz, and Space frequency is 1562.5 Hz. Mark and Space times are 1.92 milliseconds. Characters are ASCII 7-bit as defined in ANSI X3.4-1977.

The Attention Signal is transmitted after the EAS header codes and is made up of two simultaneously transmitted tones. The fundamental frequencies of these tones are 853 and 960 Hz.



#### 4.2.1 The EAS Header

The EAS header consists of seven segments:

- Preamble Sync Code
- Originator ID\*
- Event Code\*
- Location code (including county subdivision code)\*
- Event Duration
- Time Stamp\*
- Station ID\*

\* Requires user programming before installation.

Details of these codes are described in the FCC Rules and Regulations Part 11 Section 11.3/EAS Protocol and in Appendix C of this guide.

The following paragraphs provide a user guide for setting the programmable segments of the EAS Header.

#### 4.2.2 Two-Tone Attention Signal

The two-tone attention signal is the same as the old EBS: 853 Hz and 960 Hz tones. It is used only in the required monthly tests and activation of the EAS. It is not used in the required weekly test.

The duration of the two-tone signal is factory programmed at 8 seconds, however its duration is user programmable up to 25 seconds. See Section 4.9 for details.

#### 4.2.3 Getting Started

Programming the EAS 911 requires entry of a **Primary** Password and a **Setup** Password to allow access to the Setup Menu. The default passwords are 911 and 912, respectively. See Section 4.10 and 4.11 for information on changing the default passwords. Proceed as follows:

1. Enter the Primary password by pressing **PASSWORD** and entering 911, the 3-digit password, using the 0-9 numeric keys under **LOCATION(S)**.
2. Press **PASSWORD** and enter 912, the Setup password. The LCD Screen will display **SETUP MENU** briefly.

Once the correct passwords have been entered, the LCD Screen will display **SETUP MENU** briefly then display the first menu item: **1. SET CURRENT DATE/TIME**

Use the Arrow keys ( $\Delta \nabla$ ) to scroll through the Setup Menu items. The Setup Menu items are listed in Table 4.3-1. When a desired menu item is displayed, press **ENTER** to select it.

#### 4.3 SET CURRENT DATE/TIME

This menu sets the current date and local time.

Press the **ENTER** key while **1. SET CURRENT DATE/TIME** is displayed on the LCD Screen.

The LCD Screen will display the current date and time in 24-hour format.

EXAMPLE:

**JAN 01 95 18:00**

**JAN** will flash, indicating that it may be changed using the Arrow ( $\Delta \nabla$ ) keys.

After finding the correct month with the Arrow keys, press **ENTER** to accept the displayed month. The Day, Year, Hour and Minute are set in the same manner.

Clock seconds are not shown, but are zeroed when **ENTER** is pressed for selecting the desired minute.

Table 4.3-1. Setup Menu Items

1. SET CURRENT DATE/TIME
2. SET STATION TIME ZONE
3. DAYLIGHT SAVING?
4. SET STATION ORG CODE
5. SET STATION FIPS CODE
6. SET STATION IDENTIFICATION CODE
7. SET ATTENTION SIGNAL DURATION
8. CHANGE PRIMARY PASSWORD
9. CHANGE SETUP PASSWORD
10. SELECT EVENTS TO AUTO FORWARD
11. ADD LOCATIONS TO AUTO FORWARD
12. VERIFY OR DELETE LOCATIONS TO AUTO FORWARD
13. ASSIGN, CHANGE OR VERIFY ENCODER EVENT KEYS
14. ASSIGN OR RE-ASSIGN ENCODER LOCATION KEYS
15. VERIFY/EDIT ENCODER LOCATION KEY
16. VOICE RECORDER INSTALLED?
17. SET REMOTE SIGN PROTOCOL
18. ENABLE CHAR GEN INTERFACE
19. REMOTE INTERFACE DEFINITION
20. SET LCD CONTRAST
21. RECORD VOICE ANNOUNCEMENT
22. VERIFY VOICE ANNOUNCEMENT
23. ENABLE REMOTE CONTROL/STATUS MODULE INTERFACE
24. ENABLE ONE-BUTTON WEEKLY TEST?
25. SET ALERT TIMEOUT
26. SET ONE-BUTTON MANUAL FORWARD

#### 4.4 SET STATION TIME ZONE

This command permits setting the number of hours that must be added to local Standard Time to reach Universal Coordinated Time (UTC), also known as Greenwich Mean Time (GMT). Proceed as follows:

1. Use the Arrow keys to change to menu item 2.
2. Press the ENTER key while **2. SET STATION TIME ZONE** is displayed on the LCD Screen. The Arrow keys can be used to adjust the offset from -12 to +12 hours.
3. Press ENTER to accept the correct displayed UTC offset.

UTC offsets for the U.S. are listed in Table 4.4-1.

**Table 4.4-1. UTC Offsets for the U.S.**

TIME ZONE	UTC OFFSET
Eastern Standard Time	+ 05 Hours
Central Standard Time	+ 06 Hours
Mountain Standard Time	+ 07 Hours
Pacific Standard Time	+ 08 Hours
Alaskan Standard Time	+ 09 Hours
Hawaiian Standard Time	+ 10 Hours

**Note**

The UTC offset is always calculated with respect to standard time, not daylight saving time.

**4.5 DAYLIGHT SAVING TIME ENABLE**

Daylight saving time starts at 2 a.m. standard time on the first Sunday in April and ends on the last Sunday in October at 2 a.m. daylight time. The EAS 911 automatically adjusts the local time for daylight saving time if enabled. Proceed as follows:

1. Press the ENTER key while **3. DAYLIGHT SAVING?** is displayed on the LCD Screen. The LCD Screen will then display **DST: ENABLE** or **DST: DISABLE**.
2. When the desired condition is displayed on the LCD Screen, press ENTER to accept it.

EXAMPLE:

**DST: ENABLE** appears on the LCD Screen. If necessary, press Arrow key  $\Delta$  or  $\nabla$  to toggle to **DST: DISABLE**.

When the desired condition is displayed on the LCD Screen, press ENTER to accept it.

Recommended: Set for daylight saving time ENABLE.

**4.6 SET STATION ORG CODE**

The ORIGINATOR code for the station must be selected from Table 4.6-1:

**Table 4.6-1 Originator Codes**

ORG CODE	ORIGINATOR
CIV	Civil Authority
EAS	Broadcast Stations or Cable System
WXR	National Weather Service

Proceed as follows:

1. Press the ENTER key while **4. SET STATION ORG CODE** is displayed on the LCD Screen. The LCD Screen will display the currently selected 3-character ORG code.

EXAMPLE:

EAS Broadcast Station or Cable System

As the Arrow keys are pressed, the LCD Screen will display the ORG codes available, and a description of each.

Press ENTER to select a displayed ORG code.

#### 4.7 SET STATION FIPS CODE

The Federal Information Processing System (FIPS) code (See Appendix C of this Guide) consists of six digits:

PSSCCC.

P Defines a subdivision, and must be 0 for station FIPS identification.

SS Is a 2-digit State code.

CCC Is a 3-digit County code.

Stimulus: Press the ENTER key while **5. SET STATION FIPS CODE** is displayed on the LCD Screen.

The LCD Screen will display the currently selected station FIPS code.

EXAMPLE:

**STATION: 006085**

Flashing digits will prompt for entry of the 2-digit state code followed by the 3-digit county code. Use numeric keys 0-9 to enter FIPS code digits. The ∇ key will backspace; the Δ key will forward space. After the last digit is entered, the selected location will be displayed to prompt the operator to accept it. Press ENTER to accept the displayed FIPS code. Press EXIT to cancel an entry.

EXAMPLE:

**006085 SANTA CLARA CA**

The **006085** will be stationary and flashing; **SANTA CLARA CA** will scroll from right to left.

#### 4.8 SET STATION IDENTIFICATION CODE

This is the call sign of a broadcast station or other identification of a cable station, or NWS office transmitting or forwarding the message. This code is automatically affixed to all outgoing messages by the EAS encoder. It is limited to 8 characters.

1. Press the ENTER key while **6. SET STATION IDENTIFICATION CODE** is displayed on the LCD Screen.

The LCD Screen will display the currently selected identification code.

EXAMPLE:

**WAAA/FM** is displayed on the LCD Screen.

**W** will begin flashing, indicating that it may be changed using the Arrow keys.

After finding the correct alphanumeric character with the Arrow keys, press ENTER to accept.

**A** will begin flashing, indicating that it may now be changed in the same way using the Arrow keys and the ENTER key to accept.

This procedure is repeated until all the characters have been updated.

#### 4.9 SET ATTENTION SIGNAL DURATION

The attention signal is made up of 853 Hz and 960 Hz tones, and is sent as part of the Header. The duration of this signal is programmable from 0 to 25 seconds.

1. Press the ENTER key while **7. SET ATTENTION SIGNAL DURATION** is displayed on the LCD Screen.

The LCD Screen will display the currently selected Attention Signal duration.

EXAMPLE:

**08 SECONDS** is displayed on the LCD Screen with **08** flashing.

The Arrow keys increment ( $\Delta$ ) and decrement ( $\nabla$ ) the duration in 1-second steps. Pressing ENTER accepts the indicated duration.

#### 4.10 CHANGE PRIMARY PASSWORD

The primary password is used for Encoder access and consists of 3 digits. It is set to 911 at the factory and is configurable from 000 to 999.

Press the ENTER key while **8. CHANGE PRIMARY PASSWORD** is displayed on the LCD Screen.

The LCD Screen will display the current primary password.

EXAMPLE:

**911 PRIMARY** is displayed on the LCD Screen. The first digit, **9**, will begin flashing, indicating that it may be changed by pressing one of the numeric entry keys 0-9. After a digit is entered, the next digit will begin flashing. After all three digits have been entered, the entire password will flash, prompting for verification.

EXAMPLE:

**911 VERIFY** will be displayed, with **911** flashing. Press ENTER to accept; press EXIT to leave the password unchanged.

#### 4.11 CHANGE SETUP PASSWORD

The *Setup* Password is used for Setup Menu access and consists of 3 digits. It is set to 912 at the factory and is configurable from 000 to 999.

Press the ENTER key while **9. CHANGE SETUP PASSWORD** is displayed on the LCD Screen.

The LCD Screen will display the current Setup password.

EXAMPLE:

**912 SETUP** is displayed on the LCD Screen, with **9** flashing. The Setup password may be changed in the same manner as the Primary password.

#### 4.12 RECOVER LOST PASSWORD

If a password is lost or forgotten, the default passwords can be restored by entering the following key sequence when in Ready mode:

Press CANCEL, EVENT CONFIRM. The LCD will display PRESS PASSWORD. Do NOT press PASSWORD, but wait for the date and time to return to the LCD.

Each of the following key entries will cause PRESS PASSWORD to appear in the LCD. Do NOT press PASSWORD, but wait for the date and time to return before pressing the next key:

Press 4, 0, 8, 7, 2, 7, 7, 2, 7, 2, LOCATION READY.

You will hear a beep indicating that the default passwords have been restored. The default Primary password is 911; the default Setup password is 912. A 2 kHz tone will acknowledge restoration of the default passwords.

#### 4.13 SELECT EVENTS TO AUTO FORWARD

EAS events may be selected for auto forwarding. When in Auto Mode, the event code contained in a header will be compared with the event codes selected for automatic forwarding to decide if the message should be forwarded.

**In Auto Mode, priority EAN and EAT events will be forwarded automatically without delay. In Manual Mode, EAN and EAT events must be manually forwarded without delay.**

Press ENTER while **10. SELECT EVENTS TO AUTO FORWARD** is displayed on the LCD Screen. The first EAS event will be displayed. The event will appear in a static display, the description will scroll.

EXAMPLE:

◇ ADR Administrative Message

The ◇ character indicates that the event has been selected for automatic forwarding. If the diamond is absent, the event has not been selected. The ENTER key selects or deselects an event.

The Arrow keys select the next event in alphabetical order. The ENTER key is again used to choose to forward the next displayed event. The process continues until all events have been defined. Press EXIT to end.

#### 4.14 ADD LOCATIONS TO AUTO FORWARD

A list of locations to Auto Forward may be specified. When in Auto Mode, the location code contained in a header will be compared with the location codes selected for automatic forwarding to decide if the message should be forwarded. A maximum of 256 locations may be forwarded.

Press ENTER while **11. ADD LOCATIONS TO AUTO FORWARD** is displayed on the LCD Screen. The LCD Screen will display a location of 000000.

EXAMPLE:

**FORWARD: 000000** appears on the LCD Screen.

Flashing digits prompt for entry of the 2-digit state and 3-digit county code. Use the numeric 0-9 keys to enter FIPS code digits. the ∇ key will backspace; the Δ key will forward space. When the last digit is entered, the selected location will be displayed for acceptance.

EXAMPLE:

**006085 SANTA CLARA CA**

The FIPS code will flash in a static display; a description of that location will scroll. Press ENTER to add the location displayed; press EXIT to reject it.

More locations may be added in the same manner. Duplicate locations are not permitted.

#### 4.15 VERIFY OR DELETE LOCATIONS TO AUTO FORWARD

This menu item permits verification or deletion of location codes previously selected for automatic forwarding.

Press ENTER while **12. VERIFY OR DELETE LOCATIONS TO AUTO FORWARD** is displayed on the LCD Screen.

The first of the locations selected for automatic forwarding is displayed on the LCD Screen. The FIPS code is shown in a static display, and a description of that location scrolls.

EXAMPLE:

◇ **006085 SANTA CLARA, CA** appears on the LCD Screen.

The ◇ indicates that this location has been selected for automatic forwarding. The ENTER key will toggle the diamond off/on, changing the status of each location. The Δ and ∇ keys can be used to scroll through the list.

Press EXIT after deleting locations to forward.

Press ENTER to accept changes to the list of locations to forward. If EXIT is pressed, no changes will be made. Duplicate locations are allowed.

#### 4.16 ASSIGN, CHANGE OR VERIFY ENCODER EVENT KEYS

There are 11 encoder event keys that may be customized by assigning to them events appropriate to a station's broadcast area. Each key may be assigned either a defined EAS event code or an event code template based on the currently defined EAS event codes. An event code template may be used, along with the STATEMENT, WATCH, and WARNING keys, to encode an EAS event code when in Encoder Operational Mode. Note that the WEEKLY TEST key is pre-assigned with the EAS event code for the Required Weekly Test event (RWT) and cannot be changed. Access to certain event codes with national significance (for example EAN, EAT, NPT, NIC) is restricted.

Press ENTER while **13. ASSIGN, CHANGE OR VERIFY ENCODER EVENT KEYS** is displayed on the LCD Screen.

The Encoder event LEDs will begin flashing, and the LED screen will display **EVENT KEY?**

When an event key is pressed, the LED for that key will illuminate, and all other event key LEDs will extinguish. The LCD Screen will then prompt by displaying the event currently assigned to that event key. The EAS event code or an event code template will be shown in a static display, and a description of that event code or template will scroll. However, the LCD Screen will display **NOT ASSIGNED** if a previously unassigned event key is selected.

#### EXAMPLES:

RMT Required Monthly Test

CEM Civil Emergency

SVS Severe Weather Statement

TO? Tornado Template

Actual EAS event codes appear in the static display. The Arrow keys select the next EAS event code or event code template in alphabetical order. Press the ENTER key to select the currently displayed event. Other encoder event keys may then be assigned in an identical manner. After that particular key is assigned, all the event LEDs will begin flashing for the next encoder event key assignment in an identical manner.

To verify encoder EVENT key assignments, select an EVENT key as described above, then press RESET after verifying the event or template assigned to that key.

#### 4.17 ASSIGN OR RE-ASSIGN ENCODER LOCATION KEYS

Encoder LOCATION keys may be customized by assigning to them locations relevant to a station's broadcast area. A maximum of 31 locations may be assigned to each LOCATION key.

Press ENTER while **14. ASSIGN OR RE-ASSIGN ENCODER LOCATION KEYS** is displayed on the LCD Screen.

The encoder LOCATION LEDs will begin flashing, and the LCD Screen will display **LOCATION KEY?**

When a LOCATION key is pressed, the LED for that key will be lit, and all other encoder LOCATION key LEDs will be extinguished. A 000000 FIPS code will be displayed to serve as a starting point for assigning FIPS codes to the selected LOCATION key.

#### EXAMPLE:

**FIPS 01: 000000**

Flashing digits will prompt for entry of the 2-digit state code followed by the 3-digit county code. Use the numeric keys 0-9 to enter FIPS code digits. The ∇ key will backspace; the Δ key will forward space. After the last digit is entered, the selected location will be displayed to prompt the operator to accept it. Press ENTER to accept the displayed FIPS code.

**006085 SANTA CLARA**

The FIPS code will flash in a static display; a description of the location will scroll. Press ENTER to accept the location displayed and add it to the list of locations assigned to the selected LOCATION key. Press EXIT to reject. If accepted, the LCD Screen will be updated.

Other FIPS codes may be assigned to the selected LOCATION key in the same manner. Press EXIT to end. The system will return to the Setup Menu after 31 FIPS codes have been assigned.

#### 4.18 VERIFY/EDIT ENCODER LOCATION KEY ASSIGNMENT

Permits a review of the locations previously assigned to the encoder LOCATION keys.

Press ENTER while **15. VERIFY/EDIT ENCODER LOCATION KEY ASSIGNMENT** is displayed on the LCD Screen.

The Encoder LOCATION key LEDs will begin flashing; the LCD Screen will display: **LOCATION KEY?** When a LOCATION key is pressed, the LED for that key will light, and all other Encoder LOCATION keys will extinguish. If the selected LOCATION key has not yet been assigned, the LCD Screen will display **NOT ASSIGNED!** briefly, and

another LOCATION key may then be selected. If the selected LOCATION key has been assigned, the first location assigned to that key will be displayed on the LCD Screen. The FIPS code will be static and a description of that location will scroll.

**EXAMPLE:**

**006085 SANTA CLARA CA**

Use the Arrow keys to view other locations assigned to the LOCATION key. To verify another LOCATION key, press that key. Press EXIT to return to the Setup Menu.

To delete a FIPS code:

Select the FIPS code to be deleted with the Arrow ( $\Delta \nabla$ ) keys.

Press CANCEL.

The LCD will display **DELETE FIPS?**

Press ENTER to delete, or:

Press EXIT to leave the FIPS unchanged.

#### **4.19 VOICE RECORDER INSTALLED?**

Verify the presence of the optional internal voice recorder.

Press ENTER while **16. VOICE RECORDER INSTALLED?** is displayed on the LCD Screen.

The LCD Screen will display **VOICE RECORDER YES (NO)**.

**YES** indicates that the voice recorder is installed and enabled. **NO** indicates that the voice recorder is not installed or it is not enabled. Hardware will detect the presence of the voice recorder and automatically enable it if installed. This function can be used to enable or disable the voice recorder via software.

#### **4.20 SET REMOTE SIGN PROTOCOL**

The COM4 port on the 4-Port Communication Expander Option Module sends serial data to a remote electronic sign through a single twisted-pair interface using RS-232 levels. The protocol must be set for the particular electronic sign being used.

Press ENTER while **17. SET REMOTE SIGN PROTOCOL** is displayed on the LCD Screen.

The LCD Screen displays the name of the electronic sign manufacturer.

**EXAMPLE:**

**FRIEND SPRING**

Press the Arrow keys to view other protocols. Press the ENTER key to select the currently displayed protocol.

Press EXIT for no change.

#### **4.21 ENABLE CHAR GEN INTERFACE**

This command enables or disables the character generator interface.

The COM2 port on the Four Port Communications Expander Option Module sends serial data to remote character generators using RS-232 levels. The TFT Standard Interface protocol specifications are found in Appendix C.

Press ENTER while **18. ENABLE CHAR GEN INTERFACE** is displayed on the LCD Screen.

The LCD Screen will display **TFT STANDARD I/F**.

Use the Arrow keys to select **CHYRON CODI I/F** or **CHAR GEN I/F OFF**, if desired. Press ENTER to select the displayed setting.

If the TFT standard interface is enabled, a character generator must communicate properly in the TFT protocol in order for the EAS 911 to forward EAS alerts automatically. If the TFT interface is enabled and a character generator is not connected or communicating, all auto-forwarded messages will be aborted. A message can always be manually forwarded to allow the audio to be transmitted even if the character generator is not connected. If the CODI interface is enabled, messages will not be aborted if the CODI is not connected.



If the CODI interface is selected by pressing ENTER when CHYRON CODI I/F is displayed, you may use the arrow keys and ENTER to select the sub menus listed below. Again use the arrow keys to select the desired value and press ENTER to store the value. Press the EXIT key to move one level up in the menu selection process. The factory set default parameters are shown first in the menu listing below.

**NOTE:** Horizontal Phase, Subcarrier Phase and Key Delay should only be adjusted using the alignment procedures described in the Chyron CODI Operator Manual.

SET CHAR HEIGHT  
Height = 5 (range is 1-7)  
SET COLOR  
Color:White (also Magenta, Blue, Cyan, Yellow, Green, Red, Black)  
SET CRAWL SPEED  
Speed = 2 (range is 1-6)  
SET CRAWL COUNT  
Crawl Count = 2 (range is 1-8)  
SET DISPLAY LINE  
Line = 50 (range is 30-160)  
SET HORIZ PHASE  
H Phase = 0 (range exceeds  $\pm 90$ )  
SET SUBCA PHASE  
SubC Phase = 0 (range exceeds  $\pm 90$ )  
SET KEY DELAY  
Key Delay = 0 (range is  $\pm 10$ )

#### 4.22 REMOTE INTERFACE DEFINITION

The COM1 port on the Four Port Communications Expander Option Module uses full duplex serial data to communicate with a remote interface using RS-232 levels. This port is reserved for future expansion.

#### 4.23 SET LCD SCREEN CONTRAST

This menu item is used to set the LCD Screen contrast. There are 4 contrast levels (0 to 3), with 0 giving the least, and 3 giving the most contrast.

Press ENTER while **20. SET LCD CONTRAST** is displayed on the LCD Screen.

The LCD Screen displays the current LCD Screen contrast setting.

EXAMPLE:

**LCD CONTRAST: 2** is displayed on the LCD Screen.

Press the Arrow keys to select other contrast settings. The LCD Screen will reflect the new contrast setting. Press ENTER to accept the displayed setting. Press EXIT for no change.

#### 4.24 RECORD VOICE ANNOUNCEMENT

An announcement may be prerecorded for later playback. To record the announcement, the Voice Recorder must be installed and enabled. Connect the audio source to the Channel 1 (CH1) audio input of J102 on the EAS 911 rear panel. The maximum announcement duration is 25 seconds.

Press ENTER while **21. RECORD VOICE ANNOUNCEMENT** is displayed on the LCD Screen.

The LCD Screen will display a bar graph of the signal level on CH1. The audio from CH1 will be heard through the speaker. Use the bar graph to adjust the input signal level. Press ENTER to begin recording. The LCD Screen will display the elapsed duration as the announcement is recorded.

EXAMPLE:

**RECORDING 01**

Press EXIT to terminate recording. After the announcement has been recorded, it will automatically be replayed. Press EXIT to end.

#### 4.25 VERIFY VOICE ANNOUNCEMENT

The prerecorded voice announcement can be played back from the Voice Recorder. The Voice Recorder must be installed and enabled and the announcement must have been recorded previously.

Press ENTER while **22. VERIFY VOICE ANNOUNCEMENT** is displayed on the LCD Screen.

The *SPKR LED* lights to allow adjustment of speaker volume.

The LCD Screen will display: **ANNOUNCEMENT: 25** (or the length of the recorded announcement in seconds).

The speaker will play back the prerecorded announcement.

The LCD Screen will count down as the announcement is replayed. Press EXIT to interrupt playback and return to the Setup Menu.

#### **4.26 ENABLE REMOTE CONTROL/STATUS MODULE INTERFACE**

The EAS 911 can communicate with a maximum of sixteen EAS Model 941 Remote Control/Status Modules.

Press ENTER while **23. ENABLE REMOTE CONTROL/STATUS MODULE INTERFACE** is displayed on the LCD Screen.

The number of Remote Control/Status Modules currently configured will be displayed on the LCD Screen.

EXAMPLE:

##### **0 REMOTES**

Use the Arrow keys to select the number of Remote Control/Status Modules connected to the EAS 911. Select 0 to disable. Press ENTER to set the number of remotes selected. Press EXIT for no change.

#### **4.27 SET ONE-BUTTON WEEKLY TEST OPTION**

This menu item selects between a One-Button Required Weekly Test without password protection, or a password-protected Required Weekly Test. It also enables a One-Button Weekly Test from EAS 941A Remote Control/Status Modules connected to the EAS 911.

Press ENTER while **24. SET ONE-BUTTON WEEKLY TEST OPTION** is displayed on the LCD Screen. The LCD Screen will display **FAST RWT YES (NO)**. Use the arrow keys to select Yes or No, then press ENTER to accept. See section 6.2.2 for details on sending the Required Weekly Test.

#### **4.28 SET ALERT TIMEOUT**

Press ENTER while **25. SET ALERT TIMEOUT** is displayed on the LCD. The LCD will display **2 MINUTES**. Use the arrow keys to select the desired Alert Timeout from 2 to 15 minutes, then press ENTER to accept. The Alert Timeout is used to artificially terminate an alert sequence that did not conclude with a proper EOM (End of Message).

#### **4.29 SET ONE-BUTTON MANUAL FORWARD**

Press ENTER while **26. SET ONE-BUTTON MANUAL FORWARD** is displayed on the LCD. The LCD will display **FAST FWD: YES (NO)**. Use the arrow keys to select YES or NO, then press ENTER to accept. See section 6.4.5 for details on manually forwarding messages. **CAUTION:** One-Button Manual Forward bypasses password protection. This menu item also enables a One-Button Manual Forward from EAS 941A Remote Control/Status Modules connected to the EAS 911.

## SECTION V INSTALLATION

### 5.1 INTRODUCTION

This section describes the installation of the EAS 911 and its related options and equipment after it has been programmed according to methods described in Section IV. The EAS 911 installation requires the Encoder output and Decoder input level adjustment, as well as connecting the various optional and related equipment onto the EAS 911 Rear Panel.

Electrical ground for the EAS 911 is established through the AC power cord. If a more substantial technical ground is available, it may be connected to the chassis box directly, using a short piece of braid. Proper grounding, good engineering practice, and safety depend on the knowledge and care of the installing engineer.

The EAS 911 is designed to be mounted in a 19" rack or cabinet using (4) 12-24 pan head machine screws.

Mounting requirements: Size: 3.5"H x 19"W x 12"D Maximum. Weight: Approximately 12 lbs.

Power requirements: Input power: 117 VAC @ 60 Hz, 40 watts maximum, 3 Prong Power Cord - UL style SVT

Environmental requirements: 0°C to 50°C (32°F to 122°F).

#### General Hazards:

- a. Elevated Operating Ambient Temperature - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum rated ambient temperature.
- b. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- c. Mechanical Loading - Mounting of the equipment in a rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- d. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuit might have on overcurrent protection and supply wiring.
- e. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips)

### 5.2 ENCODER AUDIO OUTPUT LEVEL ADJUSTMENT

FCC regulations state that Broadcast stations are responsible for ensuring that the equipment for generating the EAS codes and the Attention Signal can modulate a broadcast station transmitter at no less than 80% of main channel modulation. Measured at peak modulation levels, each of the Attention Signal tones should modulate the transmitter at not less than 40%. These two calibrated modulation levels should have values that are within 1 dB of each other.

This procedure sets the proper signal level at the audio output of the EAS 911 Encoder. Connections are made to the AUDIO OUTPUT, J101, with a standard XLR-3 female connector.

1. Enter the primary password. The EVENT LEDs will begin flashing, and the LCD Screen will display **SELECT EVENT**.
2. Press the ENTER key in the Decoder section of the front panel. The LCD Screen will display **OPERATION MENU** briefly and then display **REVIEW RECEIVED MESSAGES**.
3. Use the Arrow (Δ ∇) keys to scroll through the Operations Menu to **SET OUTPUT LEVEL: ON-AIR RELAY OPEN**.

- 4 Press the ENTER key to select. The LCD Screen will display **LEVEL: 2. 2 Vp-p**
- 5 Adjust the audio output level by using the Arrow keys while reading the level indication on the LCD Screen. As the Arrow keys are pressed, the output level will be incremented or decremented in 0.1 Volt steps Press ENTER to accept an indicated output. Set the output to comply with the modulation percentage stated above.

### 5.3 DECODER AUDIO INPUT LEVEL ADJUSTMENT

This procedure adjusts the signal level to the EAS 911 Decoder at J102. Connections are made with the supplied mating connectors for J102. The pins are numbered from left to right when viewing the back panel. Pinouts are defined as:

Pin	Description
1	CH2 + AUDIO INPUT
2	CH2 SHIELD GROUND
3	CH2 - AUDIO INPUT
4	CH1 + AUDIO INPUT
5	CH1 SHIELD GROUND
6	CH1- AUDIO INPUT

#### Note:

The Decoder input can accommodate signals at levels of 0.5 Vp-p to 2 Vp-p. It is desirable to keep the Decoder input level at 1.5 Vp-p to utilize its full dynamic range.

1. Connect the received audio source to J102, Channel 1.
2. Press the SPKR key to activate the speaker on Channel 1. The LCD Screen will show the channel number followed by the audio signal level in bar chart form.
3. Observe the incoming level of the source.
4. If necessary, adjust the monitoring source output level for proper indication. Do not allow audio level to exceed 2 V on peaks.
5. Each time the SPKR key is pressed, it advances to the next channel in sequence. The speaker mutes after the last channel is exited. The SPKR LED illuminates when the speaker is active.
6. Repeat Steps 1 through 4 for J102, Channel 2.

### 5.4 DIGITAL INTERFACE J103 (RS-232)

The Digital Interface J103 RS-232 Port is the digital data input required by 11.33(a)(1) of the FCC Rules. It is mandated to be RS-232C with standard protocol and 1200 baud rate. Although it could be used, as described by the FCC, for Radio Broadcast Data System (RBDS), NWR, satellite, public switched telephone network, or other sources that may in future applications use EAS protocol, no specific standard is defined. Therefore, this interface connector is reserved for future expansion.

### 5.5 DIGITAL INTERFACE J104 (RS-232)

The Digital Interface J104 RS-232 Port is the digital data output required by 11.32(a)(3) of the FCC Rules. It is mandated to be for data messages (RS-232C with standard protocol and 1200 baud rate) for future applications.

### 5.6 DIGITAL INTERFACE J105 (RS-485)

This is a two-conductor balanced, twisted-pair interface to the TFT EAS 941 Remote Control/Status Module. It operates at 1200 bps half duplex and can drive up to 16 remote EAS 941 Modules. Maximum wiring distance is 2000 feet, and ground shielded twisted pair 24 AWG or heavier is required.

### 5.7 THE ON-AIR RELAY

The On-Air Relay operates (closes) when an EAS alert is generated by the Encoder, or when the EAS Decoder is in Auto mode and a valid and "tagged" EAS message is received, or when a message is manually forwarded. The relay provides a single set of dry contacts, rated 3 A 250 VAC. Contacts are Normally Open. The relay can be used to control the TFT Model 940 Program/Transmitter Interrupt unit.

The On-Air Relay releases when an EOM tone is completed. The relay contacts are available at rear panel Connector J106.

### 5.8 THE ALERT RELAY

The Alert Relay operates (closes) when a valid EAS header is detected by the Decoder. The relay provides a single set of dry contacts, rated 3 A 250 VAC. Contacts are Normally Open. When the relay operates, it remains closed until reset either locally or by remote control, or upon detection of an EOM. If no EOM is detected the relay will reset after 2 minutes except during an EAN or EAT alert.

#### Note:

Receipt of an EAN or EAT alert defeats the manual reset capability of the Alert Relay. When an EAN or EAT alert is received, the relay will reset only upon detection of an EOM.

The Alert Relay contacts are available at rear panel connector J107.

### 5.9 60 Hz CLOCK REFERENCE (J108)

This jack is provided for an optional 60 Hz input clock reference for applications that require clock accuracy better than one minute per month. An External 120 VAC to 9 VAC adapter is required to provide the 60 Hz power line AC reference for clock synchronization. The 9 VAC source should be plugged into J108 before power is applied to the EAS 911 to ensure proper operation.

### 5.10 PRINTER/SPEAKER INHIBIT (J109)

This 2 pin connector is provided to inhibit (mute) the printer and speaker when desired. A normally open switch or relay can be connected to J109. When the contacts are open, the EAS 911 printer and speaker will operate normally. When the contacts are closed, the speaker will be muted and the printer will be disabled. Incoming messages will continue to be logged and can be printed at the operator's convenience.

### 5.11 DIGITAL VOICE RECORDER, FIELD INSTALLATION

The optional plug-in voice recorder is a field installable card. The last incoming audio message, up to two minutes, is always available for the operator's immediate review. The operator can then decide whether to forward the last message received after review of the complete header and voice announcement. With the EAS 911 voice recorder option, it is not necessary for the operator to transcribe or remember text script. The optional digital voice message recorder also allows automatic forwarding of the voice message without using an external recording device.

In addition, the voice recorder can be set to provide a 25 second user-recorded announcement after the required audio interruption. This requires an initial setup to record a customized announcement by the user.

The Digital Voice Recorder can be inserted into J111 of the Main PC Board (See Figure 5.11-1 assembly drawing) inside the EAS 911, with the EAS 911 system power off. Enable the Voice Recorder by following the programming procedure described in Paragraph 4.19.

### 5.12 AUDIO INPUT EXPANDER, FIELD INSTALLATION

The optional Audio Expander board can be plugged into the EAS 911 Main PCB J112 Connector (See Figure 5.11-1). It provides 2 Audio Input connections at the EAS 911 Rear Panel J201. Each input is balanced, with a 10 k ohm DC blocked input impedance. Each audio channel is simultaneously and continuously monitored for EAS messages. Concurrent messages can be received and buffered. The rear panel connector, J201, is defined as:

J201 Pin Number	Description
1	CH3 + AUDIO INPUT
2	CH3 SHIELD GROUND
3	CH3 - AUDIO
4	CH4 + AUDIO INPUT
5	CH4 SHIELD GROUND
6	CH4 - AUDIO INPUT

### **5.13 4-PORT COMM EXPANDER, FIELD INSTALLATION**

The optional 4-Port COMM Expander can be plugged into the EAS 911 Main PCB J113 Connector (See Figure 5.11-1). It provides communication links to the following EAS 911 related equipment.

#### **COM 1**

This 9 pin J301 connector is provided on the 4-Port Communications Expander Option Module. It is an RS-232C port intended for use as a remote interface.

#### **COM 2**

This 9 pin J302 connector is provided on the 4-Port Communications Expander Option Module. It is an RS-232C interface intended for the character generator interface and is configured for the TFT protocol.

#### **COM 3**

This 9 pin J303 connector is provided on the 4-Port Communications Expander Option Module. It is an RS-232C interface reserved for future expansion.

#### **COM 4**

This 2 pin J304 connector is provided on the 4-Port Communications Expander Option Module. It is an RS-232C twisted pair interface and is intended to drive remote electronic signs.

### **5.14 FRONT PANEL PRINTER, FIELD INSTALLATION**

The Printer can be installed into the right Front Panel opening of the EAS 911 (See Figure 5.11-1). Ribbon cable is then installed to connect the Printer into J122 connector of the EAS 911 Main Board. See Section 8.4.1 to change paper and paper specifications.

### **5.15 MOVING MESSAGE SIGNS**

Moving Message Signs can be connected to J304 of the EAS 911 Rear Panel with the 4-Port COMM Expander option. The RS-232 twisted-pair drives remote Moving Message Signs via serial data.

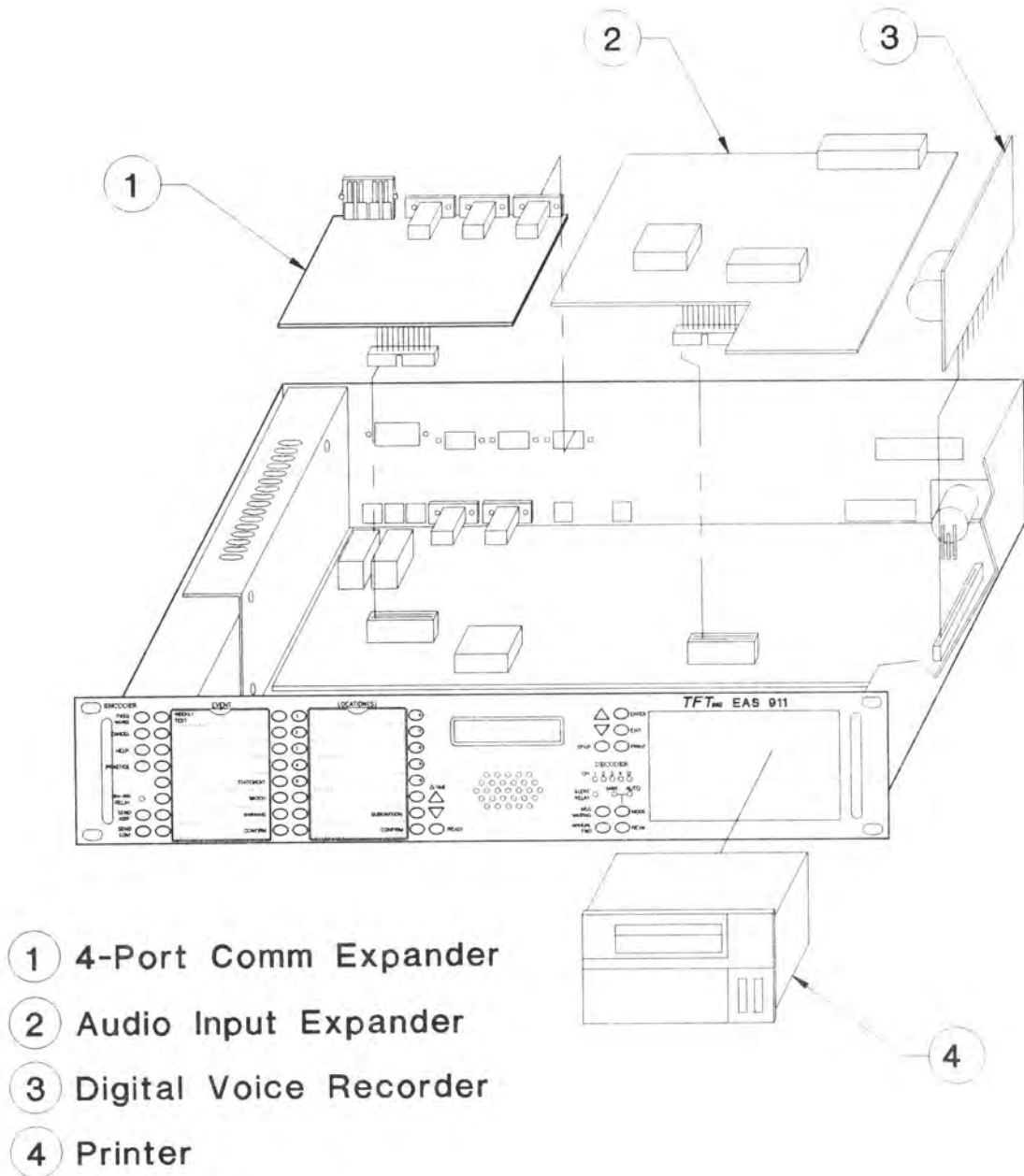


Figure 5.11-1. EAS 911 PCB and Printer Installation Diagram

# SECTION VI OPERATION

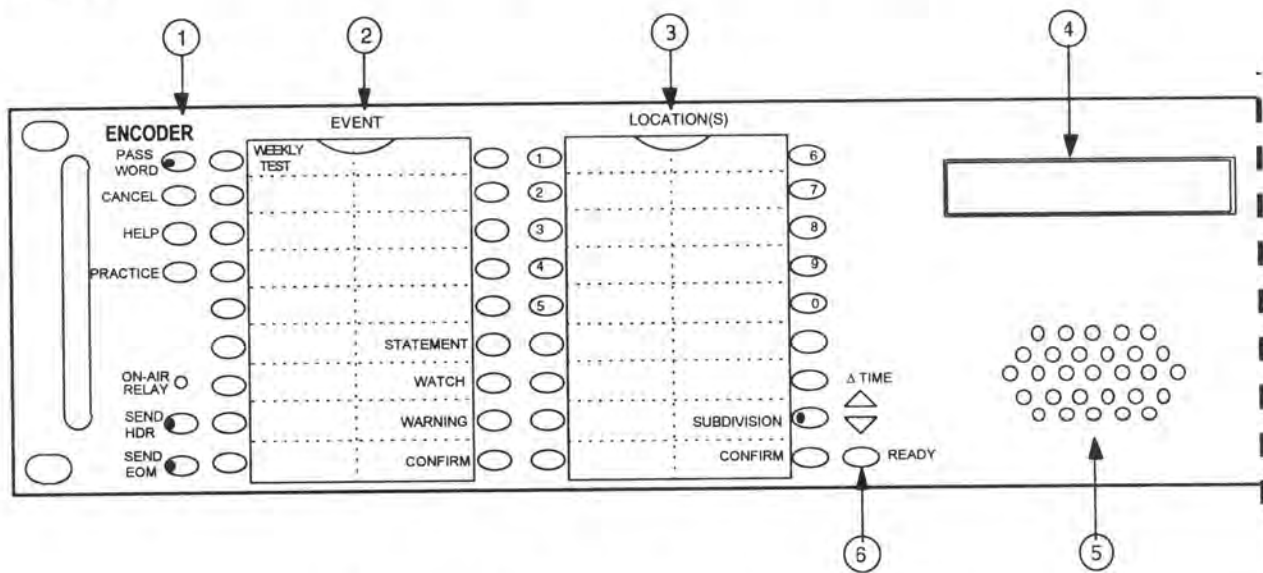
## 6.1 INTRODUCTION

This section describes EAS 911 operating procedures. The encoding of events and locations, and the transmission of alerts and required tests are described in detail.

A Primary, or Operator password must be entered into the EAS 911 to originate an EAS alert. A Secondary, or Setup Password is required, in addition, to set or make changes in operating parameters. As shipped from the factory, the EAS 911 has Primary and Secondary passwords programmed to default values of 911 and 912, respectively.

## 6.2 ENCODER SECTION

The Encoder Section generates an EAS message header as selected via the programmable EVENT and LOCATION keys. Programming of EVENT and LOCATION is explained in Section IV of this manual. Controls and indicators for the Encoder portion of the EAS 911 are explained in Section 2.3.1 The Encoder portion is shown again in Figure 6.1 for reference.



**Figure 6-1. Encoder Controls and Indicators**

### 6.2.1 Use of the HELP Key and HELP Menu

The HELP key provides two types of help: a comprehensive menu of topics and an On-Line help system that provides specific information about a mode or operation. Both types of Help messages can be printed by the optional front panel printer.

The comprehensive list of topics can be accessed in Ready mode by pressing the HELP key. A list of Help topics will be printed and will be displayed on the LCD screen. For further information on any topic, enter the topic's two-digit number using the 0-9 numeric keys and press the HELP key. Sub-topics will be printed and will be displayed on the LCD screen. Enter the desired sub-topic's three digit number and press HELP. Help information for the sub-topic will be displayed and printed.

Example: 404. To print screen: Press the PRINT key to print what is shown on the LCD screen.

On-Line Help is available when modes or operations have been selected in the Operation and Setup Menus. Press HELP to obtain specific information about a mode or operation.

All Help topics are listed in Table 6.2.1.



**Table 6.2.1 EAS 911 Help Menus**

<b>10. Password Help</b>	<b>50. Encoder Setup Help</b>
101 Access to Encoder	501 To Set Current Date/Time
102 Access to Setup Menu	502 To Set Station Time Zone
103 To Change Passwords	503 Daylight Saving?
104 Password Lost	504 To Set Station Originator Code
<b>20. Encoder Operation Help</b>	505 To Set Station FIPS Code
201 To Originate Weekly Test	506 To Set Station Identification Code
202 To Originate Monthly Test	507 To Set Attention Signal Duration
203 To Originate an Alert	508 To Assign, Change or Verify Encoder Event Keys
204 To Encode an Event	509 To Assign or Re-assign Encoder Location Keys
205 To Encode Locations	510 To Verify Encoder Location Key Assignment
206 To Encode Event Duration	<b>60. Decoder Setup Help</b>
207 To Practice Encoding	601 To Select Events to Auto Forward
208 To Send Header	602 To Add Locations to Auto Forward
209 To Review Transmit Message Log	603 To Verify or Delete Locations to Auto Forward
210 To Test On-Air Relay	<b>70. Accessory Setup Help</b>
<b>30. Decoder Operation Help</b>	701 To Enable Character Generator Interface
301 To Acknowledge a New Message	702 Voice Recorder Status
302 To Change Between Automatic and Manual Mode	703 To Set Electronic Sign Protocol
303 To Manual Forward a Message	704 To Record Voice Announcement
304 To Review Received Message Log	705 To Verify Voice Announcement
<b>40. Audio/Printer Operation Help</b>	706 To Enable CPU Interface
401 To Set Output Level On-Air	707 To Install Program Interrupt Unit
402 To Set Output Level Off-Air	708 To Enable Remote Control Status Modules
403 Speaker Volume Adjustment	<b>80. Maintenance and Technical Support Help</b>
404 To Print Screen	801 To Replace Printer Paper
	803 TFT Customer Service

### 6.2.2 How to Send a Required Weekly Test

The Required Weekly Test consists of the EAS Required Weekly Test header and the EOM (End of Message). To send the Required Weekly Test:

1. Enter the Primary password by pressing **PASSWORD**, then entering the three digit password using the 0-9 numeric keys under **LOCATION(S)**.

2. Press the WEEKLY TEST key. The LCD screen will display **RWT Required Weekly Test**.
3. Press the flashing READY key. The SEND HDR key will begin flashing, and the LCD screen will display **SEND HEADER**.
4. Press the SEND HDR key. The LCD screen will display **SENDING HEADER**, and the printer will begin to log the Weekly Test. The LCD screen will display **SEND EOM** when the header has been transmitted, and the EOM key will begin flashing.
5. Press the EOM key to transmit the End Of Message.

If the One-Button Required Weekly Test is enabled, a RWT can be sent by pressing the WEEKLY TEST button once. The SEND HEADER button will light, the On-Air Relay will close, and the Header and Two-tone Attention Signal will be transmitted. The EOM button will light, the On-Air Relay will close, and the EOM message will be transmitted

### 6.2.3 How to Send A Required Monthly Test

The Required Monthly Test consists of the EAS Required Monthly Test header, the Two-Tone Attention Signal, a test script, and the EOM. To send a Required Monthly Test, one of the EVENT keys must be programmed for the test. To program the key:

1. Enter the Primary password by pressing PASSWORD and entering the 3-digit password using the LOCATION(S) 0 - 9 numeric keys.
2. Press PASSWORD and enter the Setup password using the LOCATION(S) 0 - 9 keys. The LCD screen will display **SETUP MENU** briefly.
3. Using the Arrow keys ( $\Delta$   $\nabla$ ) keys scroll to:  
**13. ASSIGN, CHANGE OR VERIFY ENCODER EVENT KEYS.**
4. Press the ENTER key. The EVENT keys will start flashing, and the LCD screen will display **EVENT KEY**.
5. Press the EVENT key to be programmed. Use the Arrow keys to scroll until **RMT Required Monthly Test** appears in the LCD screen.
6. Press ENTER to select, then press EXIT twice to return to Ready Mode.

To send the Required Monthly Test:

1. Enter the Primary password by pressing PASSWORD and entering the 3-digit primary password.
2. Press the key programmed for Required Monthly Test. The LCD screen will display **RMT Required Monthly Test**.
3. Press the flashing CONFIRM key to accept.
4. The LOCATION keys will begin flashing and the LCD screen will display 1 LOCATION (the location automatically selected will be the Station FIPS code).
5. Additional locations may be added by pressing the pre-programmed Location keys.
6. Press the flashing LOCATION CONFIRM key. The SEND HDR key will begin flashing, and the LCD screen will display **SEND HEADER**.
7. Press the SEND HDR key. The LCD screen will display **SENDING HEADER**, and the printer will begin to log the Monthly Test. The LCD screen will display **SEND VOICE/EOM** when the header and Alert signal have been transmitted, and the EOM key will begin flashing.
8. At this time, the test script approved by your local EAS coordinator is to be read or generated on-screen.
9. Press the EOM key to transmit the End Of Message.

### 6.2.4 How to Send an EAS Alert

An EAS Alert consists of the EAS header, the two-tone alert signal, a voice, text or video message and the End Of Message code.

Before sending an EAS alert, an event, location, and duration must be encoded, or programmed. EAS event codes are described in FCC Part 11.31(e) and in Appendix D of this manual. Federal Information Processing System (FIPS) codes used to designate geographical locations are included in Appendix A of this manual.

#### 6.2.4.1 How To Encode An Event

To encode an event on one of the EVENT keys:

1. Enter the Primary password by pressing **PASSWORD** and entering the 3-digit password.
2. Press **PASSWORD** and enter the Setup password. The LCD will display **SETUP MENU** briefly.
3. Use the Arrow keys to scroll to:  
**13. ASSIGN, CHANGE OR VERIFY ENCODER EVENT KEYS.**
4. Press the **ENTER** key. The EVENT keys will begin flashing, and the LCD screen will display **EVENT KEY**.
5. Press the EVENT key to be programmed. Use the Arrow keys to scroll until the desired event, for instance, **DMO Practice/Demo Warning** appears on the LCD screen.
6. Press **ENTER** to select, then press **EXIT** twice to return to Ready Mode.

#### 6.2.4.2 How To Encode Locations And Subdivisions

FIPS Locations are encoded in six digits as PSSCCC, where P corresponds to a county subdivision, SS corresponds to the State code; CCC corresponds to the County Code. The Subdivision code will always be 0 unless authorized by your local emergency plan. To encode a location on one of the LOCATION keys:

1. Enter the Primary password by pressing **PASSWORD** and entering the 3-digit password.  
Press **PASSWORD** and enter the Setup password. The LCD screen will display **SETUP MENU** briefly.
3. Use the Arrow keys to scroll to:  
**14. ASSIGN OR RE-ASSIGN ENCODER LOCATION KEYS.**
4. Press the **ENTER** key. The LOCATION keys will begin flashing, and the LCD screen will display **LOCATION KEY?**
5. Press a LOCATION key. The LCD screen will display your station FIPS code. The first (P) digit will flash. Press 0. The first State digit will flash, prompting for entry of the State and County codes.
6. Use the 0 - 9 numeric keys to enter the first digit. The next digit will begin flashing, prompting for entry. The  $\Delta$  key will back space, and the  $\nabla$  key will forward space to let you make corrections.
7. After the last digit is entered, the FIPS code and location will be displayed on the LCD screen.
9. Press **ENTER** to accept or **EXIT** to reject and re-enter the location. If accepted, the LCD Screen will display **FIPS 02: 0SSCCC** to prompt for a second location code. Continue entering FIPS codes as necessary. A maximum of 31 codes may be entered into one location.
10. When finished programming FIPS codes, press **EXIT** to end.

#### 6.2.4.3 How to Set the Duration of an Alert

The duration of an alert can be set from 15 minutes to one hour in 15 minute increments; durations greater than an hour can be set in 30 minute increments. To set a duration:

1. Enter the Primary password by pressing **PASSWORD** and entering the three digit password.
2. Select an event by passing an **EVENT** key and the flashing **CONFIRM** key.
3. Select a location by pressing a **LOCATION** key and the flashing **CONFIRM** key.
4. The  $\Delta$ TIME READY key will begin flashing, and the LCD screen will display **00 HRS 15 MIN.**
5. Use the Arrow keys to set the desired Alert duration
6. Press  $\Delta$ TIME READY key. The **SEND HDR** key will begin flashing, and the LCD screen will display **SEND HEADER.**

The duration is now programmed. An EAS header can now be transmitted using the Event, Location and Duration selected above.

The message transmitted between the Two-Tone Attention Signal and EOM will depend upon the circumstances of the event and the format approved by your Local Operations Area Broadcast Coordinator. Contact your local coordinator for suggested wording of messages.

### **6.2.5 Use of the EOM Key**

The End Of Message code signals that a complete EAS message has been transmitted. After an Alert Header has been transmitted, the SEND EOM key will begin flashing. If a voice or video message is required, it must follow the header. At the conclusion of the message, press the EOM key to transmit the End Of Message code.

### **6.2.6 Use of the CANCEL Key**

The CANCEL key may be used to clear inputs when selecting events, locations and durations, or it can be used to return to a previous entry mode, e.g. cancel a location and return to EVENT select mode. During transmission of encoded or manually forwarded messages, CANCEL may be pressed to deactivate the ON-AIR relay and abort message transmission.

### **6.2.7 Use of the PRACTICE Key for Off-Air Testing and Training**

The Practice mode permits use of the EAS 911 for test and training without activating the On-Air relay or an external Video Character Generator.

Press the PRACTICE key in Ready mode to enter the Practice mode. The PRACTICE key will illuminate. The On-Air relay will be deactivated, and no data will be transmitted to a video character generator. All functions of the EAS 911 will be available in Practice mode.

Practice transmissions will not be entered into the transmit log. Printouts of practice transmissions will include the designation "PRACTICE." The unit will exit Practice mode before automatically forwarding an EAS message.

### **6.2.8 The EAN/EAT Operations**

The EAN event code (Emergency Action Notification) is reserved to notify broadcast stations, cable systems, industry and the general public that the EAS has been activated by the President for a national emergency.

The EAT event code (Emergency Action Termination) is similarly reserved to give notice that the EAN has been terminated.

In the event of a national emergency, the EAN header will be transmitted, followed by a Presidential message and concluded with an EAT when appropriate.

Neither the EAN nor the EAT codes can be initiated by the EAS 911, but EAN and EAT will be forwarded in either manual or automatic mode.

## **6.3 LCD SCREEN, PRINTER, SPEAKER AND CONTROL KEYS**

### **6.3.1 General Discussion**

The Liquid Crystal Display (LCD) Screen, Speaker, and Printer are used to: 1.) Program the encoder and review messages; 2.) Monitor audio inputs and messages, and 3.) Print the transmit and receive logs, displayed messages and menus, respectively.

### **6.3.2 Use of the Up $\Delta$ and Down $\nabla$ Arrow Keys**

The Up  $\Delta$  and Down  $\nabla$  Arrow Keys (or Increment and Decrement keys) are used to scroll up and down menus and to increment and decrement alphanumeric characters in certain menus. They are also used to set the speaker volume.

### **6.3.3 Use of the EXIT Key**

The EXIT key is used to exit the current menu or mode and return to the previous menu or Ready mode. During manual or automatic forwarding of an EAS message, EXIT aborts message transmission. Pressing EXIT momentarily in Ready mode will cause the current software revision to appear in the LCD. Pressing EXIT for three or more seconds will act as a system reset causing the unit to return to Ready mode.

### **6.3.4 Speaker Volume Adjustment**

The speaker volume can be adjusted with the SPEAKER and Arrow keys.

In the Ready mode and during transmit, press the SPEAKER key. The SPEAKER key will illuminate, and the volume can be increased or decreased with the Arrow keys. Press ENTER to accept.

In Setup mode and in **21. Record Voice Announcement** or **22. Verify Voice Announcement**, press SPEAKER. The speaker key will illuminate, and the volume can be increased or decreased with the Arrow keys. Press ENTER to accept.

In Operation mode and in **SET OUTPUT LEVEL: ON-AIR RELAY OPEN** (or CLOSED) press **SPEAKER**. The speaker key will illuminate and the volume can be increased or decreased with the Arrow keys. Press **ENTER** to accept.

### 6.3.5 Print Message from the LCD Screen

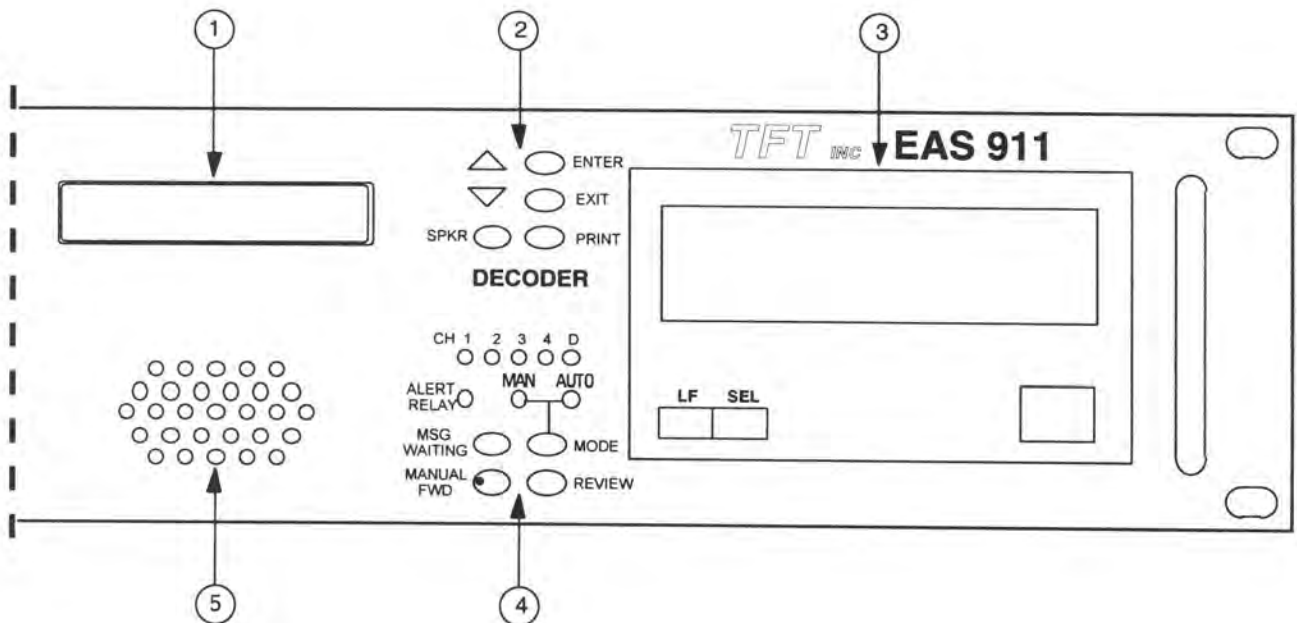
Pressing the **PRINT** key causes the item displayed on the LCD screen to be printed. A time stamp is appended to all printer output.

## 6.4 DECODER SECTION

The Decoder section manages all functions associated with incoming EAS signals. Those functions include:

- Monitoring and decoding incoming EAS headers
- Providing alert signals upon receipt of valid headers
- Monitoring incoming audio signals through the speaker and with LED indicators
- Setting Manual and Auto Forward modes
- Reviewing Transmit and Receive message logs

Decoder Controls and Indicators are shown in Figure 6.3-1.



**Figure 6.3-1 Decoder Controls and Indicators**

### 6.4.1 LED Indicators

The LED Indicators monitor audio activity on Channels 1 through 4. When the input signal level to a Channel exceeds -10 dBm, its LED will illuminate.

The Channel D LED monitors the RS-232 Channels and illuminates upon receipt of data.

### 6.4.2 Manual and Auto Forward Mode Selection

Incoming EAS messages can be forwarded Automatically or Manually with operator intervention. In Automatic mode, messages are forwarded immediately upon receipt. In Manual mode, messages can be reviewed by an operator before being forwarded. The **MODE** key toggles between the Manual and Automatic operating modes.

1. Press the **MODE** key. The LCD screen will display **PASSWORD?**, and the **PASSWORD** key will begin flashing.
2. Enter the primary password. The Mode will toggle from Manual to Auto, or vice-versa. The current Mode will be indicated by a yellow LED.

### 6.4.3 Reviewing Previous EAS Messages

The last EAS message can be reviewed from Ready mode by pressing the REVIEW key. The last message will scroll on the LCD screen, and the voice message will be heard through the speaker.

As many as ten messages can be buffered in the Received Message Log. To view the messages in the log:

1. Enter the Primary Password. The LCD screen will display **SELECT EVENT**.
2. Press the ENTER key. The LCD screen will display **OPERATION MENU** briefly, then **REVIEW RECEIVED MESSAGES**.
3. Press ENTER.
4. The LCD screen will display 01 and the last received message. If a diamond character (◊) follows the 01, it indicates that the message has not yet been printed.
5. Use the Arrow keys to scroll through the messages.
6. Press the PRINT key to print any of the messages.

### 6.4.4 Acknowledging the Last EAS Message and Resetting the Alert Relay

When an EAS message is received, The MSG WAITING key will begin flashing, the Alert Relay LED will illuminate, and the alert relay contacts will close. After reading the message scrolling on the LCD screen, acknowledge receipt of the message by pressing the MSG WAITING key. The Alert Relay contacts will open, its LED will extinguish and the MSG WAITING LED will extinguish.

### 6.4.5 Manually Forwarding An EAS Message After Review

After reviewing an EAS message, it can be forwarded as follows:

1. Press the MANUAL FWD key. The LCD will display **PASSWORD?**
2. Enter the Primary password. The message will be displayed on the LCD, and the SEND HDR key will flash. Press the SEND HDR key. The LCD will display **SENDING HEADER**, and the Header will be forwarded. The LCD will then display **SEND VOICE/EOM**, and SEND HEADER and SEND EOM keys will flash
3. Press the SEND HEADER key to send the recorded alert voice message. If the recorded message is not desired, studio personnel can insert a local message from your audio console without pressing the SEND HEADER key.
4. Press the SEND EOM key. The LCD will display **SENDING EOM**.
5. The EAS 911 will return to Ready mode.

If One-Button Manual Forward is enabled, a message can be forwarded by pressing the MANUAL FORWARD key. The header, two-tone attention signal, voice message and EOM will be transmitted automatically. Before forwarding, the recorded voice may be reviewed by pressing MSG WAITING, then REVW. CAUTION: One-Button Manual Forward bypasses password protection.

## 6.5 FUNCTIONS AVAILABLE FROM THE OPERATION MENU

### 6.5.1 The Operation Menu

The Operation Menu: 1.) Provides access to the transmit and receive logs; 2.) Permits testing of the On-Air and Alert relays; and 3.) Permits adjustment of the output audio signal level.

To access the Operation Menu, enter the Primary Password, then press ENTER. The LCD screen will display **OPERATION MENU** briefly, then 1. **REVIEW RECEIVED MESSAGES**.

### 6.5.2 Review Received Messages

Use the Arrow keys to scroll to 1. **Review Received Messages**. Press ENTER to review the messages. Messages will be numbered from 1 to 10 and will be in the order from most recent (1) to the earliest (10) Use the Arrow keys to move from one message to another; press ENTER to review the message. A diamond (◊) next to the message number indicates that the message has not yet been printed on the front panel printer.

### 6.5.3 Review Transmitted Messages

Use the Arrow keys to scroll to 2. **Review Transmitted Messages**. Press ENTER to review the messages. Messages will be numbered from 1 to 10 and will be in the order from most recent (1) to the earliest (10) Use the Arrow keys to move from one message to another; press ENTER to review the message. A diamond (◊) next to the message number indicates that the message has not yet been printed on the front panel printer.

#### **6.5.4 Test On-Air Relay**

Use the Arrow keys to scroll to **3. Test On-Air Relay**. Press ENTER to close the On-Air relay contacts. The red ON-AIR LED will illuminate and the relay contacts will close for two seconds. After two seconds, the relay will open, and the LED will turn off.

#### **6.5.5 Test Alert Relay**

Use the Arrow keys to scroll to **4. Test Alert Relay**. Press ENTER to close the Alert relay contacts. The red ON-AIR LED will illuminate and the relay contacts will close for two seconds. After two seconds, the relay will open, and the LED will turn off.

#### **6.5.6 Set Output Level: On-Air Relay Open**

This menu item permits adjustment of the audio output level from 0.5 to 6.0 volts peak-to-peak while the EAS Attention signal is transmitted. The On-Air relay will not close.

Use the Arrow keys to scroll to **5. Set Output Level: On-Air Relay Open**. Press ENTER. The LCD Screen will display the output audio level. Use the Arrow keys to increment or decrement the audio level in 0.1 volt steps. The XLR audio output (J101) will reflect the new level. Press ENTER to halt transmission and set the output level to the value displayed. Press EXIT to return to the Operation Menu.

To adjust the speaker volume while setting the output level, press the SPEAKER key, then use the Arrow keys to adjust the volume. The Arrow keys will not affect the XLR output level when the SPEAKER key is illuminated.

#### **6.5.7 Set Output Level: On-Air Relay Closed**

This menu item permits adjustment of the audio output level with the On-Air relay closed.

Use the Arrow keys to scroll to **6. Set Output Level: On-Air Relay Closed**. Proceed as in 6.5.6, Set Output Level: On-Air Relay Open, above.

## SECTION VII THEORY OF OPERATION

### 7.1 The EAS Information Super Highway

The Emergency Alert System (EAS) is a nationwide network of radio and television broadcast and cable facilities that can originate or receive and forward (re-transmit) event- and location-specific Emergency Alert messages. Alert messages can originate from the White House, state and local safety agencies, Emergency Operation Centers (EOC), and the National Weather Service (85% of alerts are weather related).

When an agency issues an Alert, it transmits an EAS header and message to local AM, FM, and TV stations and cable systems which, in turn, broadcast the message to the general public if the message matches the local requirements. The public can receive alert messages in a matter of seconds and can react quickly to impending emergencies. Figure 7.1 shows a symbolic representation of the EAS message routing.

The EAS message contains digitally encoded event and location information in addition to a normal voice or text announcement. The encoded information permits the network of broadcast and cable stations to decode messages and forward them automatically or manually to a specific area affected by the emergency alert.

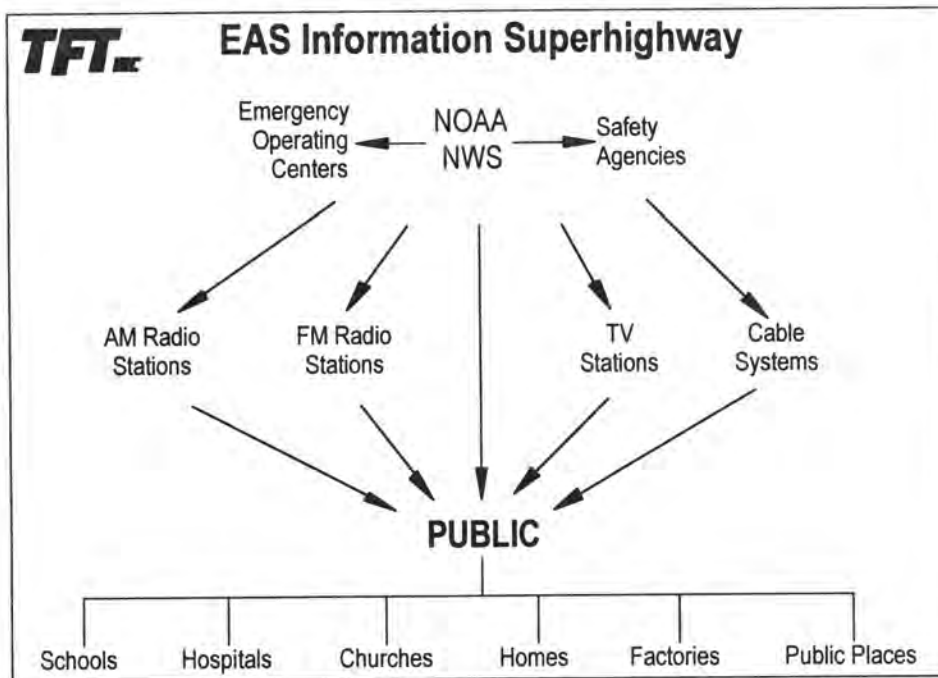


Figure 7.1



## 7.2 The EAS 911: An Overview

The EAS 911 Encoder/Decoder is similar to a smart telephone answering machine. It receives and screens messages on one, two or four lines, records and stores them, and forwards selected messages manually or automatically.

The digital header in the incoming message is decoded and translated, then displayed on the Liquid Crystal Display (LCD), logged on the optional printer, and sent to an optional external message sign. The event and location data is compared with the data stored in the Setup memory to determine if it should be forwarded.

If the alert message is to be forwarded, the EAS 911 inserts a new I.D. code and re-transmits it, along with a two-tone Attention Signal, the recorded voice message and an End Of Message signal. Forwarding can occur automatically or after operator intervention.

Refer to Figure 7.2 for a simplified block diagram of the EAS 911 Encoder/Decoder.

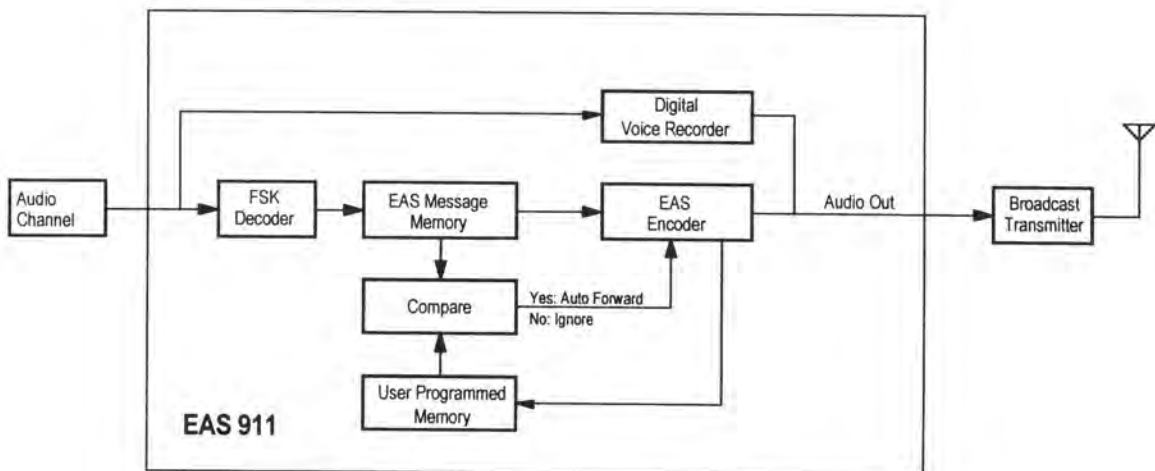


Figure 7.2, EAS 911 Block Diagram

## 7.3 A Closer Look: Detailed System Block Diagram

The EAS 911 system consists of the Main Board, the Encoder and Decoder keyboards, the LCD Display Assembly, the optional Digital Voice Recorder, the optional Audio Input Expander, the optional 4-Port Comm Expander and the optional Printer. Figure 1 in Appendix A illustrates the EAS 911 system blocks in detail.

## 7.4 Main Board (Figure 2, Appendix A)

The EAS 911 Main Board consists of three major system blocks: Audio Loop-Through and Switching, Digital Signal Processor/CPU, and Input/Output Control.

### **7.4.1 Audio Loop Through and Switching (Figure 2, Appendix A)**

The audio buffering, switching and control section is illustrated on sheet 1 of the Main Board schematic drawing (6601-4030).

U1 and U2 provide two balanced input amplifiers for the Channel 1 and 2 audio inputs. Analog switches U3, U8 and U10 route audio signals to and from the inputs, outputs and voice recorder. U4 and U5 are Coders/Decoders (CODECs) that convert the audio signals to digital data, and vice-versa. U7 provides two buffer amplifiers at the outputs of the CODECs. U11 is the internal speaker amplifier; U12 provides a balanced audio EAS message output.

### **7.4.2 Digital Signal Processor/CPU (Figure 2, Appendix A)**

The Digital Signal Processor (DSP) section and its related logic is illustrated on sheet 2 of the schematic drawing (6601-4030).

U14 is a Texas Instruments TMS320C26 digital signal processor that performs all encoding and decoding functions, and controls all I/O activity. U13 is a Field Programmable Gate Array (FPGA). It generates all internal timing signals and performs all internal digital signal routing. U15 is a real-time clock and provides battery backed-up memory for long term storage of setup information. U16 and U18 are the system random access memory (RAM); U17 and U19 are the system read-only program memory. U21 is a reset circuit and watchdog timer.

### **7.4.3 Input/Output Control (Figure 2, Appendix A)**

Input/Output buffering and control for system peripherals and related equipment, is illustrated on sheet 3 of the schematic drawing (6601-4030).

U25 through U29 are latches that control the printer, liquid crystal display (LCD), four port communication expander, audio multiplexers and relays. U23 controls the On-Air and Alert relays. U22 and U30 provide RS-232 inputs and outputs; U24 provides an RS-485 interface for the EAS 941 Remote Control/Status module.

### **7.5 Encoder Key Board (Figure 4, Appendix A)**

U501, U505, U509, U503, U507 and U511 in series form a 48-bit serial-to-parallel shift register that is used to illuminate the 40 encoder board LEDs. The bits of LED data are shifted in to the keyboard by the I/O control section, above, and then enabled to illuminate or flash the LEDs.

U512, U510, U508, U506, U504 and U502 in series form a 48-bit parallel-to-serial shift register that is used to sense the 41 encoder key switches. The bits of switch data are shifted out of the encoder keyboard by the I/O control section, above, and are then interpreted by the DSP/CPU.

### **7.6 Decoder Key Board (Figure 6, Appendix A)**

U601 and U603 in series form a 16-bit serial-to-parallel shift register that is used to illuminate the 12 decoder board LEDs. The bits of LED data are shifted in to the keyboard by the I/O control section, and then enabled to illuminate or flash the LEDs.

U604 and U602 in series form a 16-bit parallel-to-serial shift register that is used to sense the ten decoder key switches. The bits of switch data are shifted out of the decoder keyboard by the I/O control section, above, and are then interpreted by the DSP/CPU.

## **7.7 LCD Display Assembly**

The LCD Display Assembly is a 16-character back-lit display with contrast controlled by setup software. The LCD assembly is controlled by the FPGA through an 8-bit parallel data interface at U26 on the main board.

## **7.8 Digital Voice Recorder (Figure 8, Appendix A)**

U3 is a sampling analog-to-digital (A-D) and digital-to-analog (D-A) converter that converts incoming voice messages to digital data and stores the data in memories U5, U6, U7, U8 and U9. U10 and U11 select memory locations for voice storage. To play back a message, U3 retrieves digital data from the memories and converts it back into its original analog form.

U4 and U12 provide audio signal buffering, gain, and Automatic Level Control (ALC).

U2 controls the routing of the audio input and output signals. The FPGA on the main board controls U3 and U2 through an 8-bit parallel data interface at U1.

## **7.9 Printer**

An optional 24-column ASCII impact printer is controlled by the FPGA through an 8-bit parallel data interface.

## **7.10 Audio Input Expander (Figure 10, Appendix A)**

An optional Audio Input Expander Option provides two Audio Input channels at the EAS 911 Rear Panel, J201.

U207 is a Texas Instruments TMS320C26 digital signal processor decodes the incoming EAS audio on Channels 3 and 4, and controls all I/O activity. U206 is a Field Programmable Gate Array (FPGA). It generates all internal timing signals and performs all internal digital signal routing. U210 and U211 are the expander's random access memory (RAM); U208 and U209 are the read-only program memory. U213 is a memory and I/O decoder; U212 is a reset circuit and watchdog timer.

U201 and U202 provide two balanced input amplifiers for the Channel 3 and 4 audio inputs. Analog switch U203 routes audio signals to the main board. U204 and U205 are Coders/Decoders (CODECs) that convert the audio signals to digital data.

## **7.11 4-Port COM Expander (Figure 12, Appendix A)**

An optional 4-Port Comm Expander Option provides communication links to external EAS 911 related equipment such as a character generator or PC controller.

U302 and U303 are Dual Asynchronous Receiver/Transmitters (DUARTs) that convert parallel data to serial data, and vice-versa. They transmit data to and from the main board through an 8-bit parallel interface at U301. They transmit data to COM1 to 4 outputs through EIA quad line driver U306. They receive data from COM 1 to 4 from EIA quad line receiver U305. The DUARTs are controlled by the FPGA on the main board.

## SECTION VIII MAINTENANCE AND REPAIR

### 8.1 INTRODUCTION

The EAS 911 has no moving parts or components that require routine replacement. It requires only minor audio adjustment, which will be described later in this section. In addition, the printer paper and ribbon may need to be replaced.

### 8.2 TOOL AND TEST EQUIPMENT REQUIREMENTS

The following tools and equipment are required for EAS 911 maintenance:

- Hand Tools
- Digital Voltmeter
- Oscilloscope
- Audio generator
- XLR out to 3-pin audio input cable

### 8.3 ROUTINE MAINTENANCE

The EAS 911 should require no routine maintenance other than printer paper and ribbon replacement. As equipment and systems external to the EAS 911 change, audio level adjustments may be necessary. In addition, the real time clock contains a lithium batter that will require replacement after a number of years. Refer to Paragraph 8.3.3 for battery replacement procedure.

#### 8.3.1 Calibration

The EAS 911 Encoder and Decoder functions can be calibrated by connecting the Audio Out at J101 of the Rear Panel to Audio Input J102 with a XLR OUT to three-pin AUDIO INPUT cable.

Press the following keys: PASSWORD, 9, 1, 1, WEEKLY TEST, READY, SEND HDR. The On-Air Relay LED will light and the LCD will display "**SENDING HEADER**" first, then "**SEND EOM**". The Printer will print the EAS message if it is installed.

Press the SEND EOM key. The LCD will display "**SENDING EOM**" first, then the EAS message. Press the MSG WAITING key, then CANCEL. The EAS 911 will return to the Ready (Banner) Mode.

#### 8.3.2 Audio Levels

The EAS 911 Encoder Output Audio Level and the Decoder Input Audio Level can be adjusted periodically as described below.

##### 8.3.2.1 Encoder Audio Output Level Adjustment

This procedure sets the proper signal level at the audio output of the Encoder portion of the EAS 911 (J101). Proceed as follows:

1. To access the Operation Menu, enter the Primary Password, then press ENTER. The LCD will display **OPERATION MENU** briefly, then **1. REVIEW RECEIVED MESSAGES**.
2. Use the up/down arrow keys ( $\Delta\nabla$ ) to scroll to 6. Set Output Level: On-Air Relay Open. Press the ENTER key to activate the displayed menu selection. The LCD will respond by scrolling: LEVEL: 2.2 V pep. The LCD will display the output audio level.
3. Adjust the audio output level by using the up/down arrow keys while reading the level indication on the LCD display. As  $\Delta\nabla$  keys are pressed, the audio output level will be incremented or decremented in 0.1 volt steps. Press ENTER to accept an indicated output. The output should be set to comply with the modulation percentage stated above. A level of 2.2 V p-p corresponds to 0 dBm.

4. The two tones can be accessed individually by using the  $\Delta$  TIME  $\uparrow\downarrow$  arrows. The 960 Hz tone, Both, or the 853 Hz tone can be selected.
5. Press EXIT to return to the Ready mode.

### 8.3.2.2 Decoder Audio Input Level Adjustment

1. Connect the monitoring source to J102, Channel 1.
2. Press the SPKR key to activate the speaker on Channel 1. The LCD display shows the channel number followed by the audio signal level in bar chart form.

**Note:**

The Decoder input can accommodate signals at levels of 0.7 Vp-p to 2 Vp-p. It is desirable to keep the Decoder input at 1.5 Vp-p to utilize its full dynamic range.

Observe the incoming level of the source.

4. If necessary, adjust the monitoring source output level for proper indication. Do not allow audio level to exceed 2 Vp-p on peaks.
5. Each time the SPKR key is pressed it advances to the next channel in sequence. The speaker mutes after the last channel is exited. The SPKR LED illuminates when the speaker is active.
6. Repeat Steps 1 through 4 for J102, Channel 2.

### 8.3.3 Lithium Battery Replacement

The real time clock, U15, uses a lithium battery. It will require replacement after a number of years. Replace only with a standard CR2032 lithium coin cell. In early versions of the EAS 911, the battery is contained within U15. Contact TFT for replacement information



Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

## 8.4 PRINTER

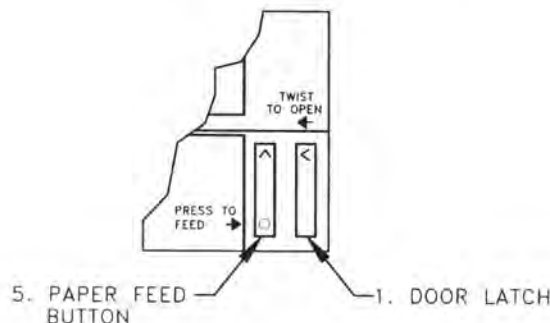
### 8.4.1 Operator Information

#### Door Latch Button

To open the front door of the printer, twist the door latch button (1) counterclockwise using the thumb and forefinger. This will release the latch, and the door can be pulled outwards to expose the paper roll.

#### Paper Feed Button

To activate the paper feed, press the lower part of the paper feed button (2). This will continue for as long as the button is held down.

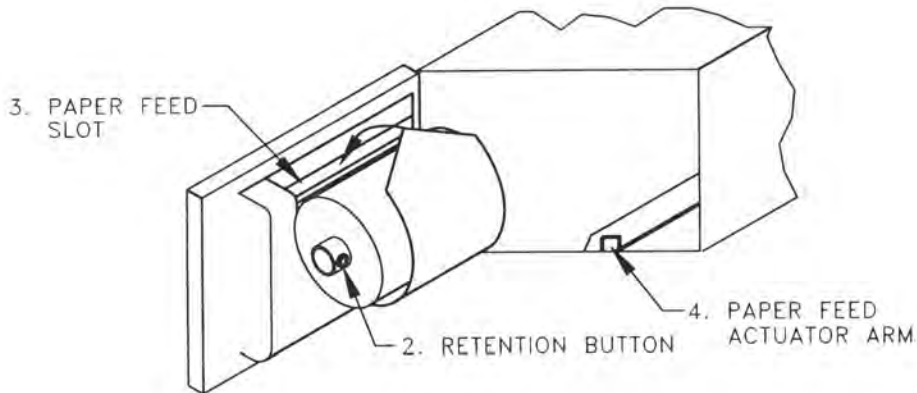


**Figure 8.4-1. Printer Controls**

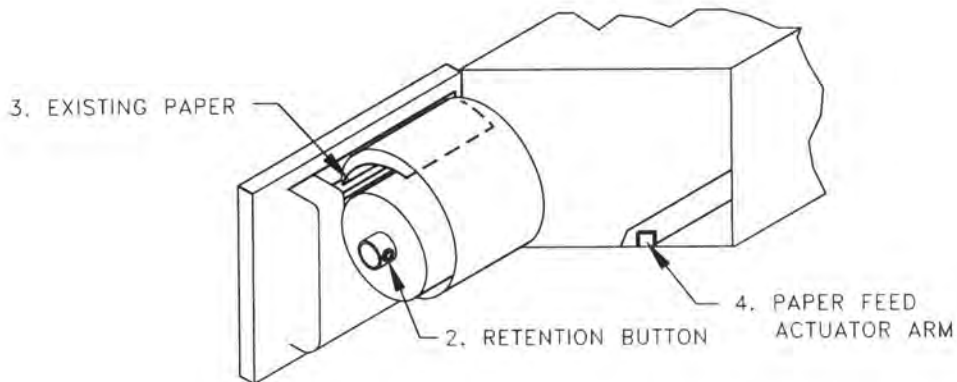
## 8.4.2 Paper Roll Replacement

Proceed as follows to replace the printer paper:

1. Twist the door latch counterclockwise to release and open the door.
2. Depress the retention button to allow the paper roll to slide across the bar.
3. If paper does not remain in the feed slot from the old roll, cut or fold the end of the new roll into a V-shape as shown. Insert the point into the paper feed slot (See **Method A**). If paper does remain from the old roll, simply insert the blunt edge of the new roll on top of the old paper in the feed slot (See **Method B**).
4. Push the paper feed actuator arm to advance the paper. Hold it until the feed mechanism pulls the paper through to the front of the printer. Turn the paper roll so that any loose turns are wound snugly against the roll and close the door.
5. More paper may now be fed through by pressing the paper feed button.



### **Method A**



### **Method B**

Figure 8.4-2. Paper Roll Replacement

### 8.4.3 Ribbon Cartridge Replacement

Tear off any paper emerging from the printer. To open the printer door, refer to paragraph 8.4. 1.

Carefully press the door and bracket in vertically opposite directions until the latch is released. Do not pull the door and bracket apart without first releasing the catch. See figure 8.2 item (3). Swing the chassis back leaving the door fully open. This will expose the printer mechanism and ink ribbon cartridge. Refer to figure 8.4-3.

- (1) Press in on the end of the ink ribbon cartridge marked "PUSH", and carefully remove the used cartridge. Push replacement cartridge in place, ensuring that the paper lies between the ribbon and the steel printer plate, and the ribbon cartridge spindle is correctly seated over the printer ribbon drive shaft. Ensure that the ribbon is taut and parallel to the paper. If necessary, tighten the ribbon by turning the faceted disk (2) clockwise using your fingernail or small blade screwdriver. Make sure the paper protrudes through the front of the printer mechanism. Ensure that the paper will pass clearly through the guide channel and past the tear bar before snapping the bracket shut against the back of the door.

Turn the paper roll by hand so any loose turns are wound snugly against the roll. Close the door and check that the paper flows freely, using the paper feed button.

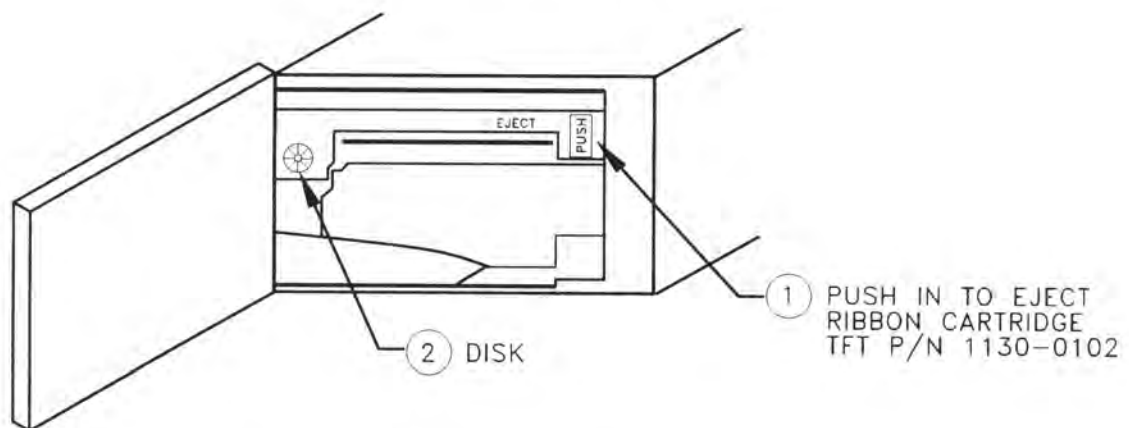


Figure 8.4-3. Ribbon Cartridge Replacement

### 8.4.4 Printer Supply Ordering Information

Paper Roll Size:

- Paper width is 2.25 inches
- The inside diameter of the spool hole is either .50 inch or .438 inch
- Paper roll outside diameter is 1.90 inches

**Note:** Remove paper from a roll with diameter greater than 2.00 inches until the diameter is less than 2.00 inches. Paper roll supplies are listed in Table 8.4.4-1, while ribbon cartridge supplies are listed in Table 8.4.4-2.

**Table 8.4.4-1 Paper Roll Suppliers**

<b>Item</b>	<b>Paper Roll Distributors</b>	<b>Catalog/Stock No.</b>	<b>Manufacturer and Part No.</b>
1	McWhorter's Tel. 1-800-426-1368	CR-022	Labelon Corp. Part No. LAB CR022
2	McWhorter's Tel. 1-800-426-1368	27-301	AMPAD Corp. Part No. 27-301
3	Office Depot Tel. 1-800-519-7222	302-224	NCR Part No. NCR856607
4	TFT, Inc. Tel. 408-727-7272 Ext. 300 Fax 408-988-3988	1130-0103EAS	Able System Part No. A160-PR

**Table 8.4.4-2 Ribbon Cartridge Suppliers**

<b>Item</b>	<b>Ribbon Cartridge Distributors</b>	<b>Catalog/Stock No.</b>	<b>Manufacturer and Part No.</b>
1	McWhorter's Tel. 1-800-426-1368	ESP H00CR-BB	NU-KOTE Part No. NUKPM 267
2	Office Depot Tel. 1-800-519-7222	506-501	NU-KOTE Part No. NUKPM 267
3	Weigh-Tronix Tel. 707-527-5555	223320029	EPSON Part No. ERC-09
4	Omni Print Tel. 714-457-0229	ERC-09	EPSON Part No. ERC-09
5	TFT, Inc. Tel. 408-727-7272 Ext. 300 Fax 408-988-3988	1130-0102 EAS	EPSON Part No. ERC-09

## **8.5 DIAGNOSTICS AND REPAIR**

Since most EAS 911 users have limited diagnostic and repair facilities, the most practical maintenance philosophy is repair by circuit card replacement. It is recommended that spare circuit cards be on hand, together with an alternative plan for operation while repairs are being made.

Some general (and very important) observations on repair:

1. The EAS 911 series of equipment uses static sensitive components. ESD (Electrostatic Discharge) precautions must therefore be observed during repairs. This is extremely important.
2. The EAS 911 breaks down into subassemblies located on individual circuit cards and, in general, card level replacement is best maintenance philosophy.
3. The Theory Of Operation Section (Section VII) is helpful in understanding how the EAS 911 equipment functions and will help you with diagnostics, as it covers the jobs performed by each major component and subsystem.



## 8.6 TROUBLESHOOTING

Most of the EAS 911 functions can be troubleshot by performing the Encoder to Decoder self test as described below.

The EAS 911 Encoder and Decoder functions can be tested by connecting the Audio Out at J101 of the Rear Panel to Audio Input J102 with a XLR out to 3-pin Audio Input Cable.

Press the following keys: PASSWORD, 9, 1, 1, WEEKLY TEST, READY, SEND HDR. The On-Air Relay LED will light and the LCD will display "SENDING HEADER" first, then "SEND EOM". The Printer will print the EAS message if it is installed.

Press the SEND EOM key. The LCD will display "SENDING EOM" first, then the EAS message. Press the MSG WAITING key then CANCEL. The EAS 911 will return to the Ready Banner (Banner) Mode.

## 8.7 TFT CUSTOMER SERVICE DEPARTMENT

TFT emergency service is available 24 hours a day. Please call us if you need assistance with any TFT products.

### **TFT, Inc.**

3090 Oakmead Village Drive

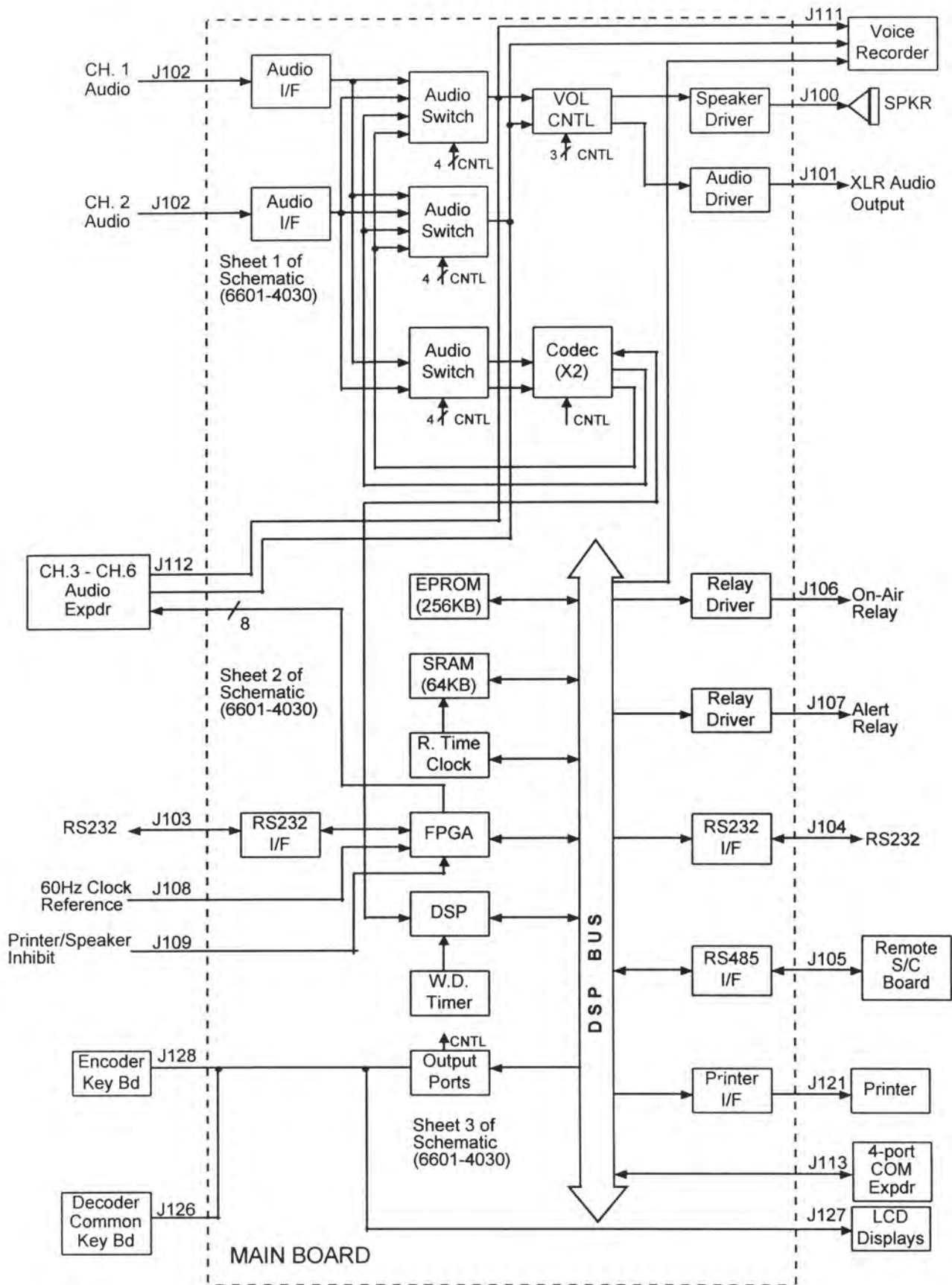
Santa Clara, CA 95051-0862

Telephone: (408) 727-7272, Fax: (408) 727-5942

## APPENDIX A

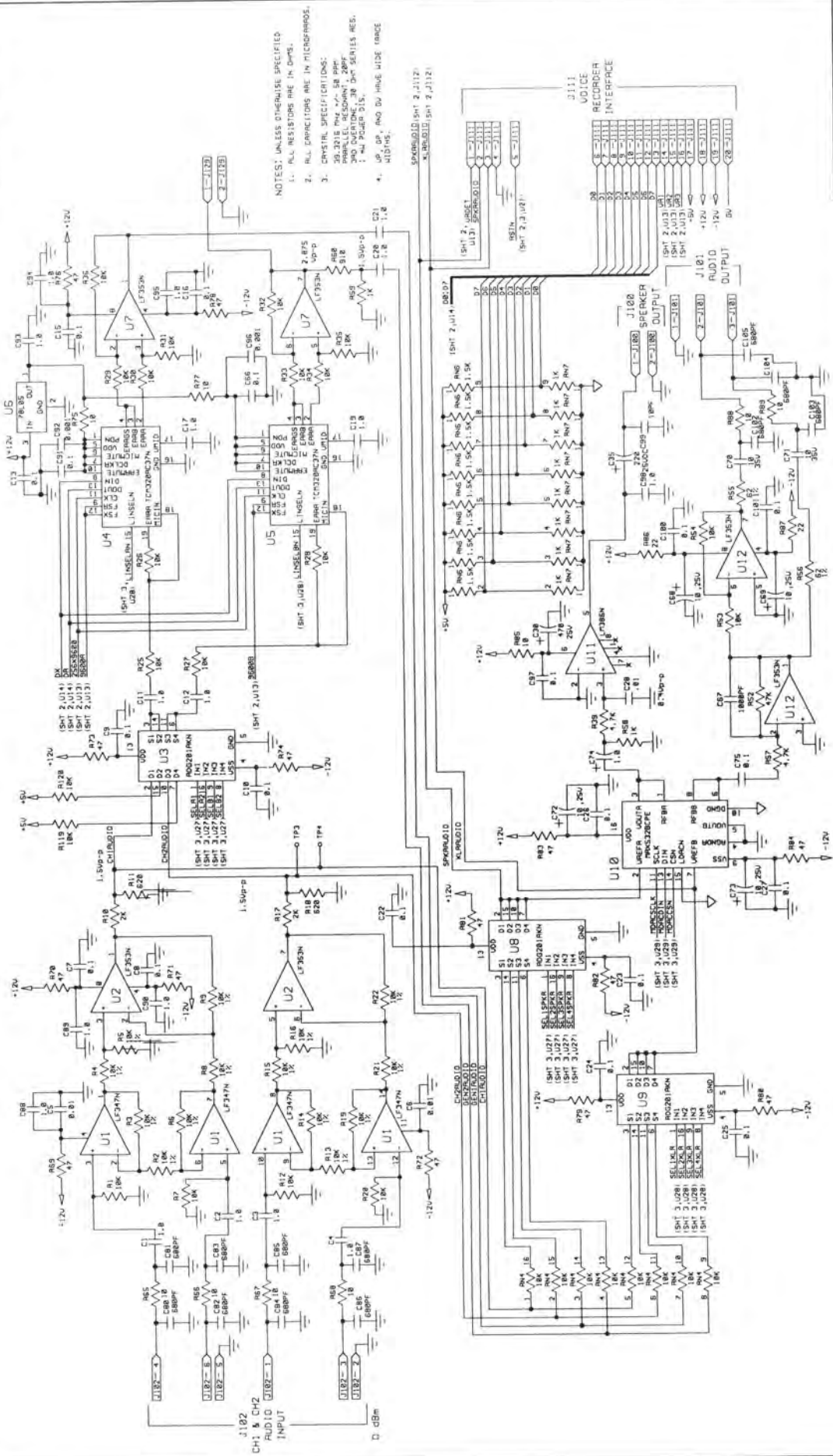
### ENGINEERING DRAWINGS

FIG.	TITLE	DWG NO.	REV.
1.	EAS 911 System Block Diagram .....	6600-2840	A
2.	Main Board Schematic.....	6601-4030	E
3.	Main Board Assembly.....	6608-4030	E
4.	Encoder Key Board Schematic.....	6601-4027	C
5.	Encoder Key Board Assembly .....	6608-4027	C
6.	Decoder Key Board Schematic.....	6601-4028	C
7.	Decoder Key Board Assembly .....	6608-4028	C
8.	Digital Voice Recorder Board Schematic .....	6601-4016	E
9.	Digital Voice Recorder Board Assembly.....	6608-4016	E
10.	Dual/Quad Audio Expander Board Schematic.....	6601-4041	C
11.	Quad Audio Expander Board Assembly .....	6608-4041	C
12.	4-Port COM Expander Schematic.....	6601-4032	B
13.	4-Port COM Expander Assembly .....	6608-4032	B



## EAS 911 SYSTEM BLOCK DIAGRAM

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A	1	INITIAL RELEASE	11-11-95	
B	1	REWORK	2-5-96	
C	1	REWORK	4-4-96	
D	1	MODIFIED TO 2.112, 2.114, 2.116	7-1-96	
E	1	FINAL APPROVAL	9-18-96	
F	1	ECO 2.135 & 2.136		



- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE IN OHMS.
  2. ALL CAPACITORS ARE IN MICROFARADS.
  3. CRYSTAL SPECIFICATIONS:  
 PARTIAL FREQUENCY: 200K  
 FREQUENCY TOLERANCE: ±0.01%  
 Q: 4000  
 MODE: OVER-TONE, 3R 5TH SERIES RES.  
 : 44 POWER DIS.  
 : 4.0V, 0.1μ, AND 0V HAVE WIDE RANGE  
 : WIDTHS.

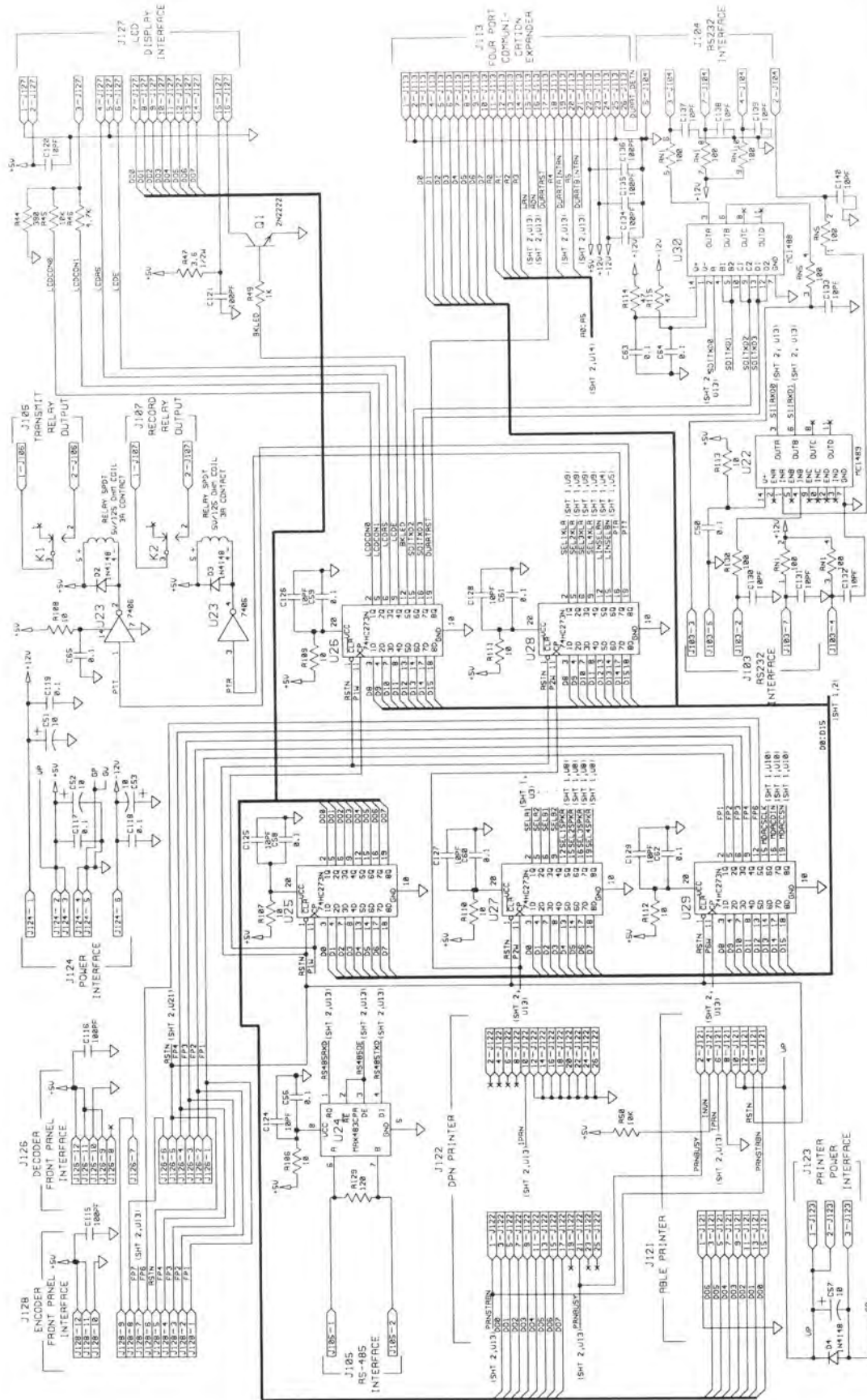
1932 DAWKINS VILLAGE DR.  
 SANTA CLARA, CA. 95051  
 (408) 727-2772  
 SCHEMATIC DIAGRAM,  
 EAS 511 MAIN BOARD,  
 TYPE B  
 TYP NO. 040 5521-4830 E  
 SCALE: NONE  
 SHEET 1 OF 3

APPROVALS	DATE
DESIGNER	9-18-96
CHECKED	
FILE NO.	040 5521-4830
MODEL	HEAT RSTY
REL.	
APPLICATOR	
S.A.	

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Figure 2 (Sheet 1 of 3)



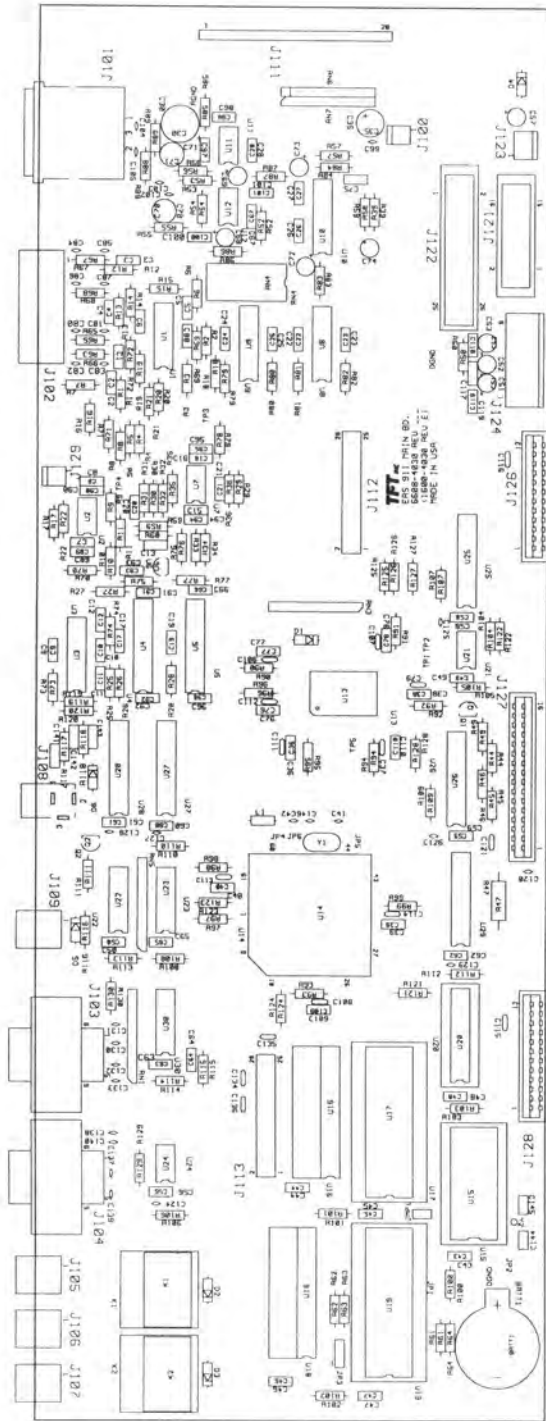


3202 DMKRED VILLAGE DR.  
 148B1727-722  
 SCHEMATIC DIAGRAM  
 EAS 911 MAIN BOARD  
 SIZE B PAPER NO. 552-4832 REV. 1  
 SUPPL. NONE SHEET 3 OF 3

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Figure 2 (Sheet 3 of 3)

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	B	RELWORK	2-1-95	
	C	RELWORK	4-88-95	
	D	RELWORK	7-11-95	
	E	FIX C74, ADD C146 & L1, ECO 2135, 2136	9-18-95	



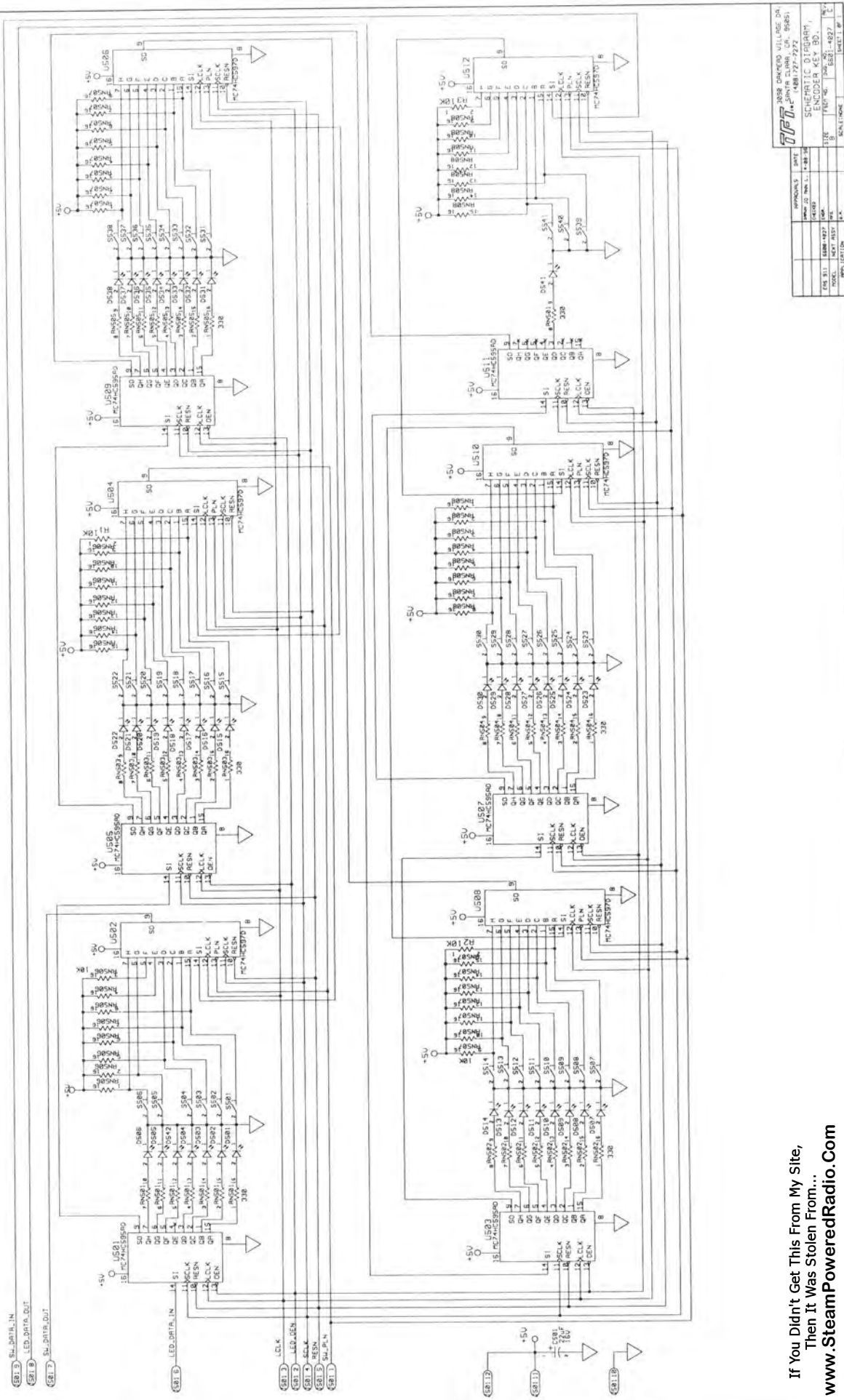
- NOTES:
1. ALL CAPS TO BE FLUSH ON PCB.
  2. MAXIMUM LEAD HEIGHT NOT TO EXCEED .075"

APPROVALS	DATE
DESIGN: JO ANN L.	9-18-95
CHECKED:	
ENGR:	
APP: NEXT ASSY	
SCALE	1 OF 1

<p><b>TPT INC</b> 3858 OAKMEAD VILLAGE DR, SANTA CLARA, CA, 95051 (408) 727-7272</p>	
<p>ASSEMBLY DRAWING, EAS 911 MAIN BD.</p>	
SIZE: FSC# NO.	DWG. NO.
C.	6508-4030
SCALE	REV. E
	SHEET 1 OF 1

Figure 3

DATE	REV.	BY	DESCRIPTION
11-17-06	1	PL/CDM	INITIAL RELEASE
11-17-06	2	PL/CDM	REVISION
11-17-06	3	PL/CDM	REVISION



PROJECT NO.	480127-272
DATE	11-17-06
DESIGNER	PL/CDM
CHECKED	PL/CDM
SCALE	AS SHOWN
SHEET NO.	1 OF 1

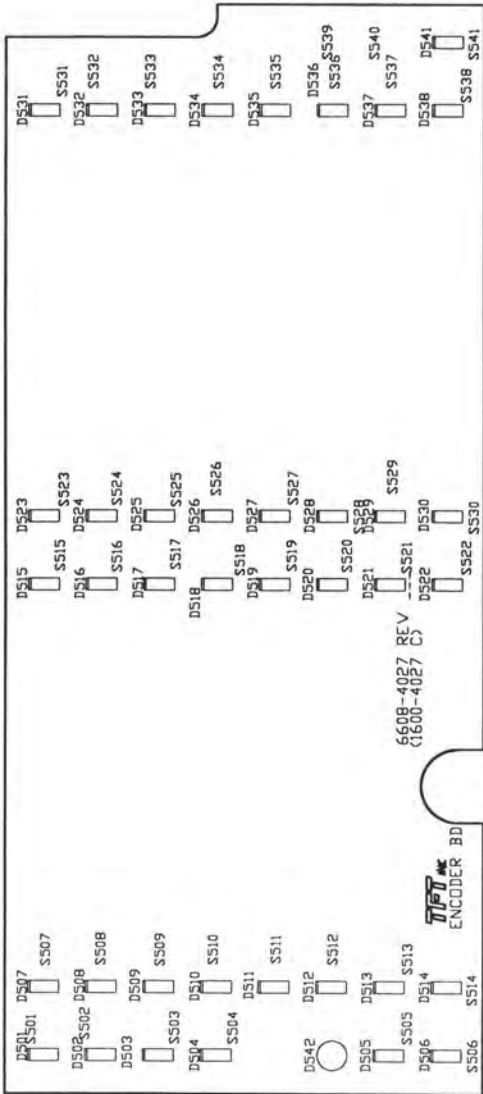
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[www.SteamPoweredRadio.Com](http://www.SteamPoweredRadio.Com)

Figure 4

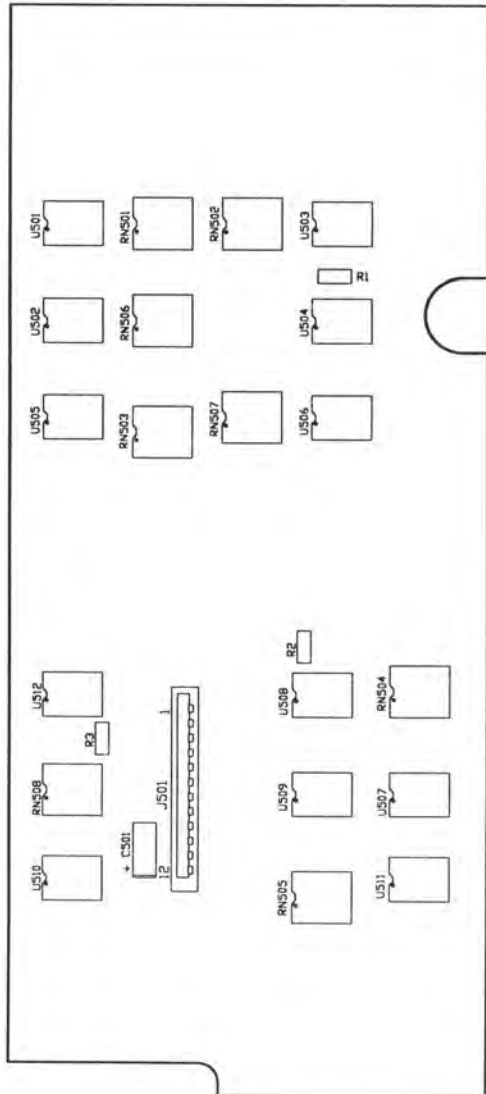


REVISIONS

REV	DESCRIPTION	DR	DATE	APPD
C	FORMAT CHANGE	LS	7-31-96	



FRONT SIDE



BACK SIDE

NOTES:  
1. MAX LEAD HEIGHT FOR J501 IS .025".

**TPT TIME**  
3090 DANHEAD VILLAGE DR.  
SANTA CLARA, CA 95051  
(408)727-7272

ASSY, ENCODER KEY BD.

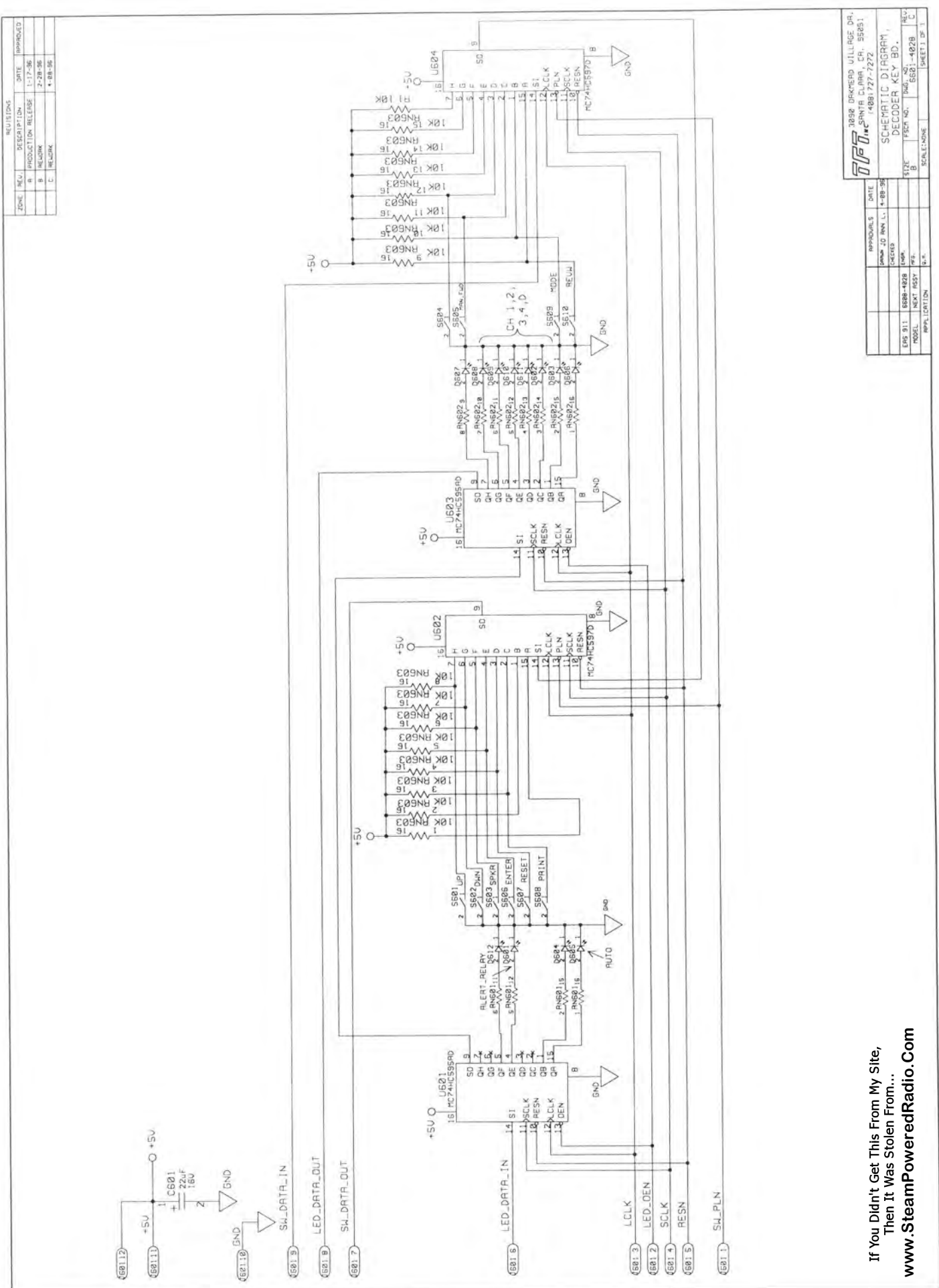
SIZE: C DWG NO: 6608-4027 REV: C  
SCALE: NONE SHEET: 1 OF 1

APPROVALS	DATE
DRAWN LARRY S.	7-31-96
CHECKED	
DATE	
BY	

SPECIFICATIONS UNLESS OTHERWISE SPECIFIED  
DECIMAL = 2 PLACE ± .01  
3 PLACE ± .005  
ANGULAR = ±

EAS 911RT	5102-3954
MODEL	NEXT ASSY
APPLICATION	

Figure 5



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A	1	PRODUCTION RELEASE	1-17-96	
B	2	REWORK	2-28-96	
C	4	REWORK	4-08-96	

APPROVALS		DATE
DESIGN	JOHNS L.	4-08-96
TESTING		
QC		

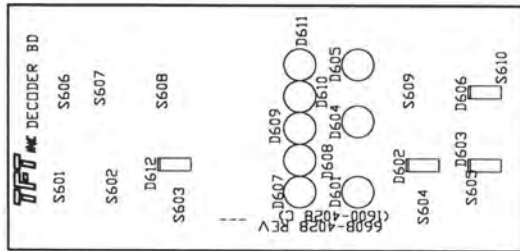
3832 DARKERD ULLIAGE DR.  
SANTA CLARA, CA. 95051  
1-601-727-7272

SCHEMATIC DIAGRAM	
DECODER KEY BD.	
SIZE	1/2" PAPER
REV.	1
DATE	4-08-96
DESIGNER	JOHNS L.
CHECKED	
APPROVED	

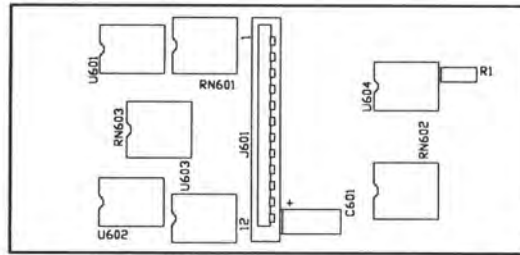
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Figure 6

REVISIONS			
REV	DESCRIPTION	DR	DATE
C	FORMAT CHANGE	LS	7-31-96



FRONT SIDE



BACK SIDE

NOTES:

1. MAX LEAD HEIGHT FOR J601 IS .025".

**TPT**  
 3090 DAKHEAD VILLAGE DR.  
 SANTA CLARA, CA 95051  
 (408)727-7272

ASSY, DECODER KEY BD

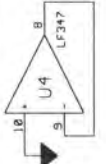
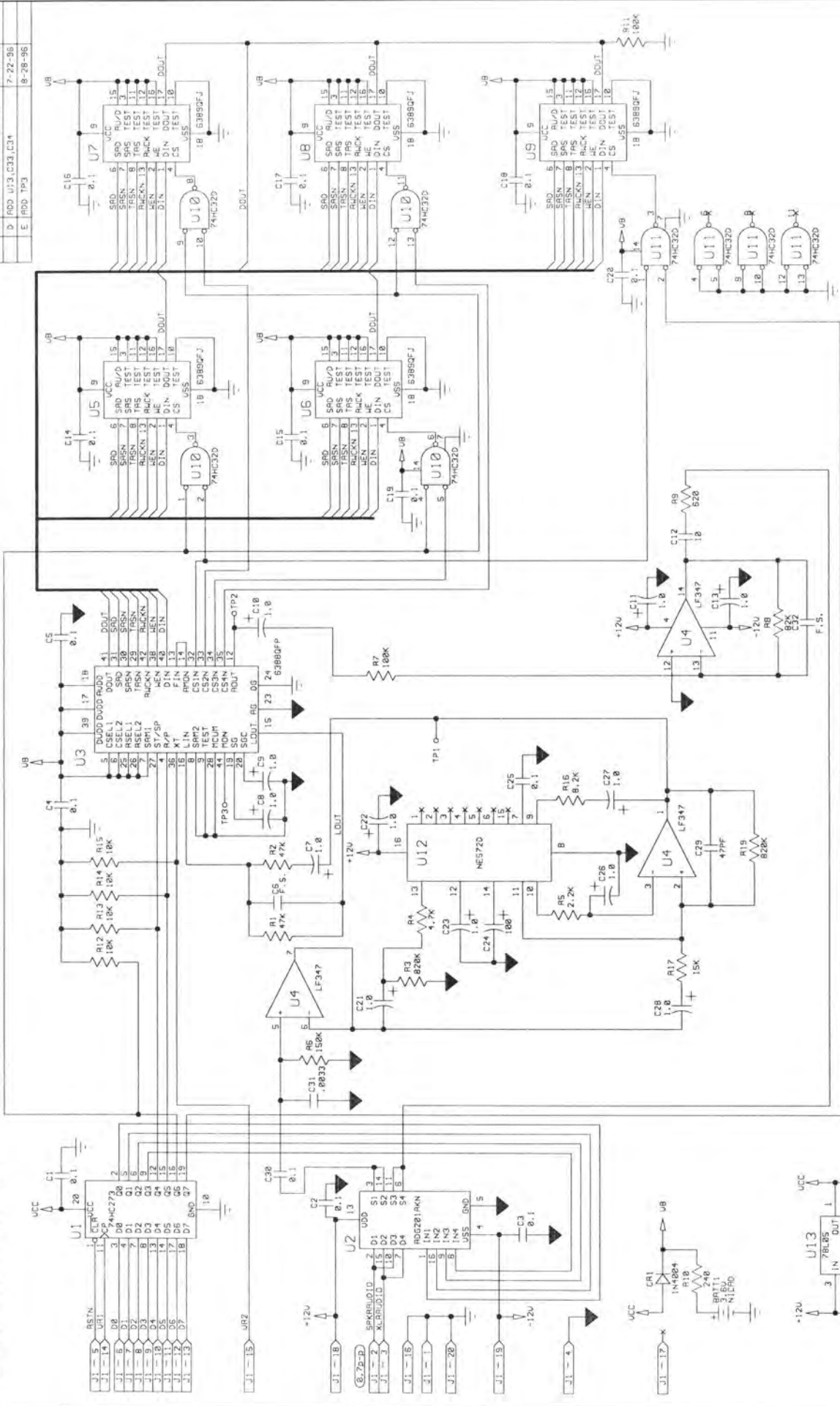
SIZE: C  
 DWG NO: 6608-4028  
 SCALE: NONE

APPROVALS	DATE
DAVE LARRY S.	7-31-96
CHECKED	
ENGR	
W/G	
D/A	


SPECIFICATIONS UNLESS OTHERWISE SPECIFIED  
 DECIMAL = .01  
 2 PLACE = .01  
 3 PLACE = .005  
 ANGLE = 45°

EAS 911,RT	5102-3954
MODEL	NEXT ASSY
APPLICATION	

REV.	DESCRIPTION	DATE
A	INITIAL RELEASE	11-10-94
B	CHANGES	2-13-95
C	ADD DND PLANE TO PCB	3-10-95
D	ADD U73, C33, C14	7-22-95
E	ADD TP3	9-28-95



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[www.SteamPoweredRadio.Com](http://www.SteamPoweredRadio.Com)

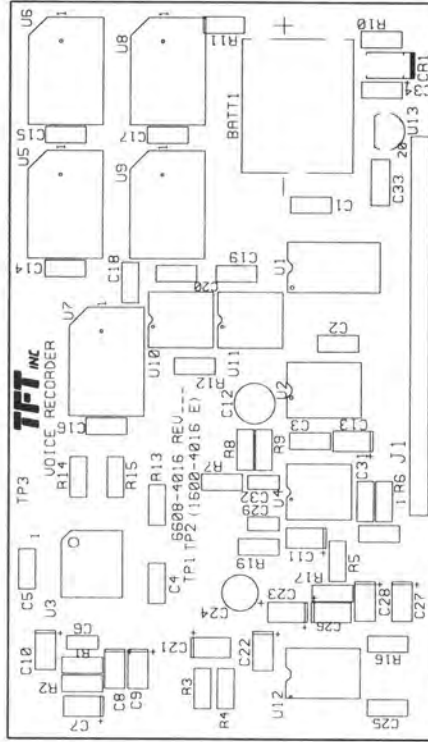

 2898 OAKWOOD VILLAGE DR.  
 SANTA CLARA, CA, 95051  
 (408) 727-7272  
 SCHEMATIC DIAGRAM  
 VOICE RECORDER  
 QST / QRP NO.    SERIAL NO. 15501-4015  
 DATE    MODEL    NEAT ASSY    S.K.  
 APPLICATION  
 SHEET 3 OF 1

NOTES: UNLESS OTHERWISE SPECIFIED  
 1. ALL RESISTORS ARE IN OHMS.  
 2. ALL CAPACITORS ARE IN MICROFARADS.

Figure 8

REVISIONS

REV	DATE	APPROVED
B	2-15-96	
C	3-26-96	
D	3-26-96	
E	8-28-96	



NOTES:

1. ALL CAPS TO BE FLUSH ON PCB.
2. MAXIMUM LEAD HEIGHT NOT TO EXCEED .075".


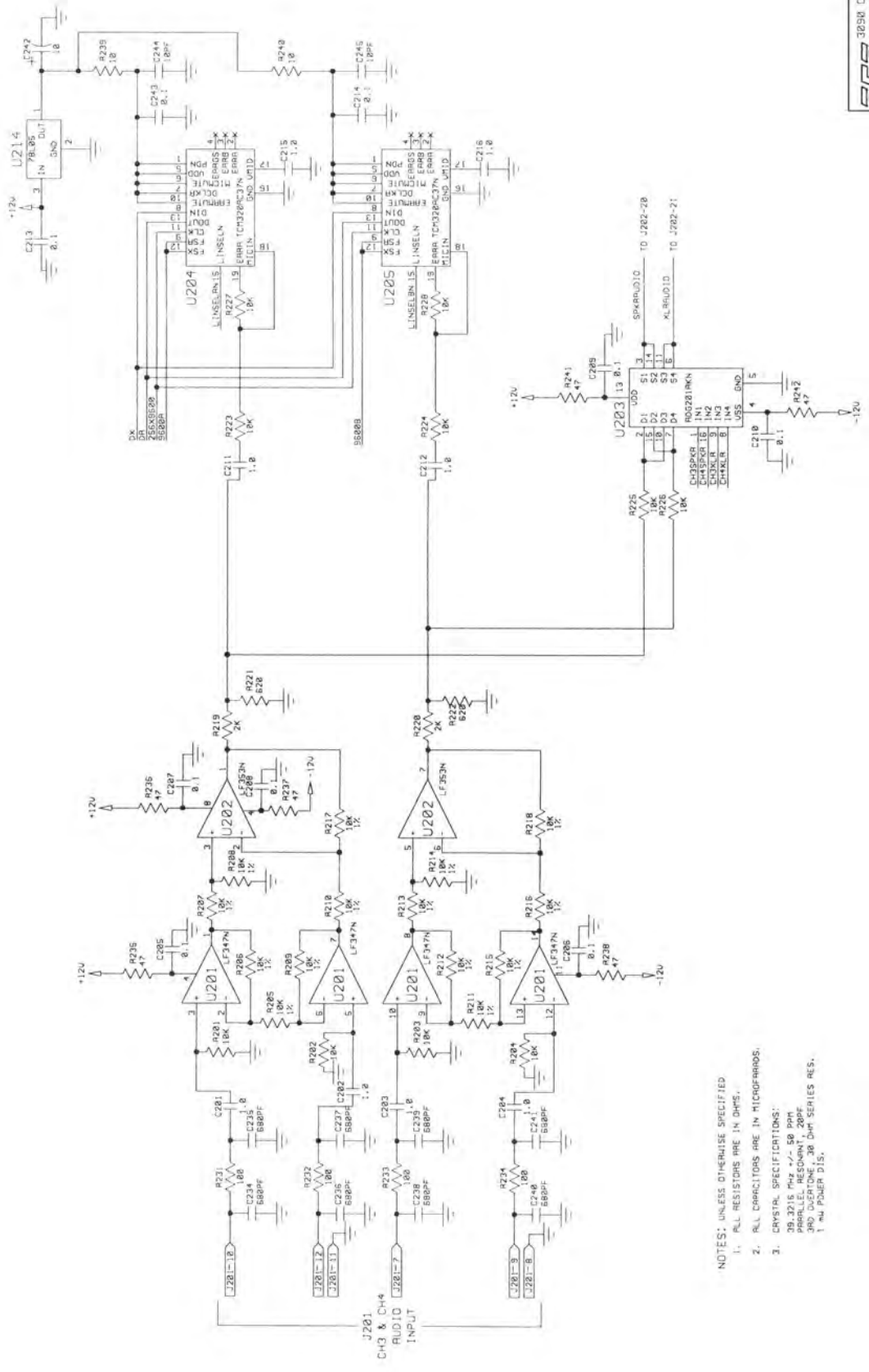
		3090 ORKMEAD VILLAGE DR. SANTA CLARA, CA 95051 (408) 727-7272	
ASSEMBLY DRAWING VOICE RECORDER BD.		SIZE C	DWG. NO. 6608-4016
APPROVALS DRAWN: JO ANN L. CHECKED: ENGR. MFG Q. A.		DATE 8-28-96	REV E
APPLICATION		SCALE: NONE SHEET 1 OF 1	

Figure 9

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	1	PRODUCTION RELEASE	8-11-98	
	B	ADD J203, INK837, P1, 2	7-11-98	
	C	ADD DUAL NOTE SH1 2	10-21-98	

REVISIONS



- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE IN OHMS.
  2. ALL CAPACITORS ARE IN MICROFARADS.
  3. CRYSTAL SPECIFICATIONS:  
39.3215 MHz +/- 50 PPM  
PARALLEL-RESONANT, 20PF  
1.5% TOLERANCE, 30 DMT SERIES RES.  
1.5V POWER D.I.S.

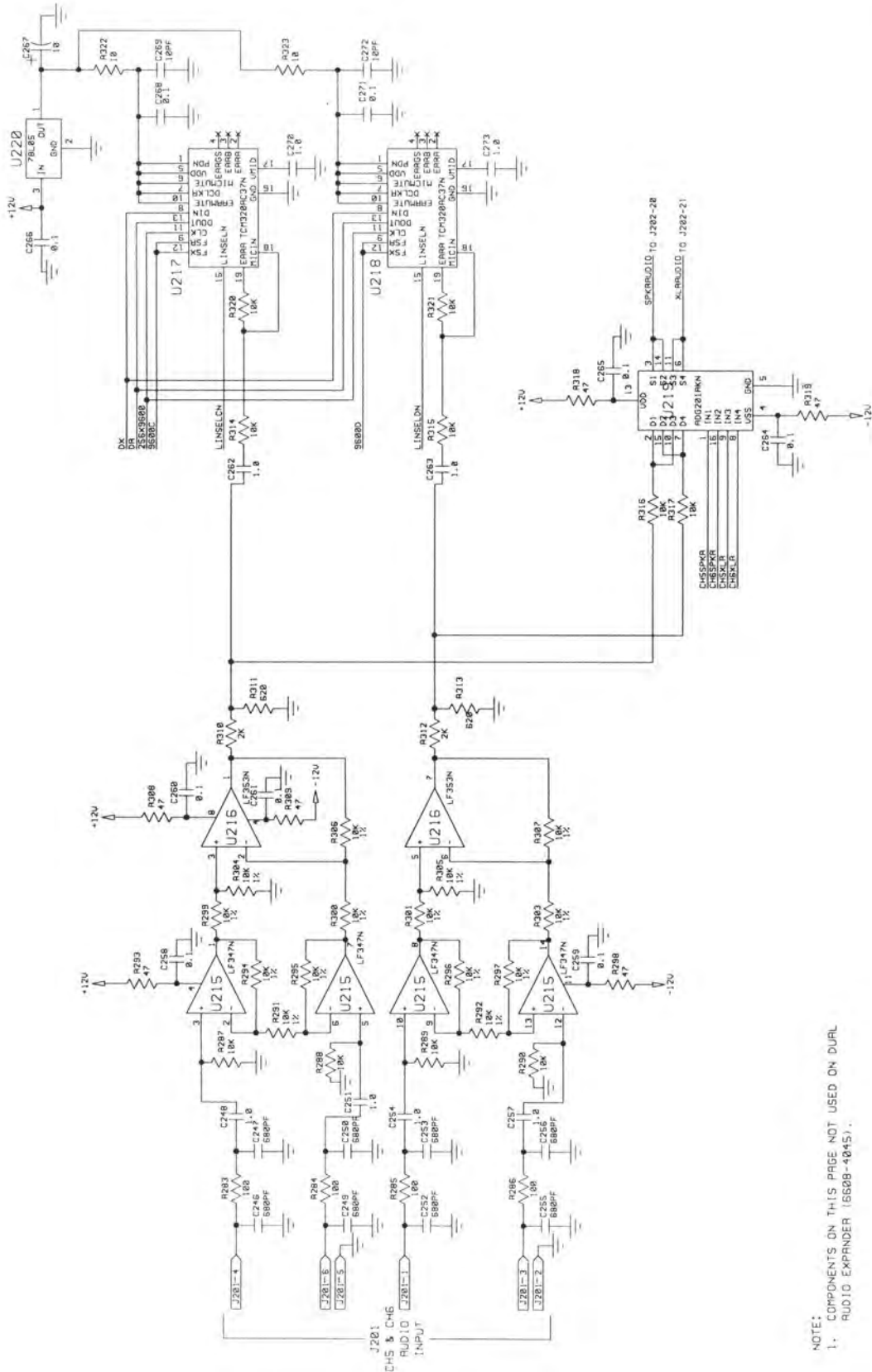
**TOP Inc.**  
10508 ORMEAD VILLAGE DR,  
SANTA CLARA, CA, 95051  
(408) 727-7272

APPROVALS	DATE
JOBAN JD RNH	10-1-98
EM511M, T4 5588B-4845	UNCHECKED
EM511M, T6 5588B-4841	EMPH.
MODEL	NEXT REV'S
APP. LOCATION	D.A.
SCALE: NONE	SHEET 1 OF 3

SCHEMATIC DIAGRAM	DWG. NO.	REV.
DUAL/QUAD AUDIO EXPANDER	5501-4041	C
SIZE	5501-4041	PFL.

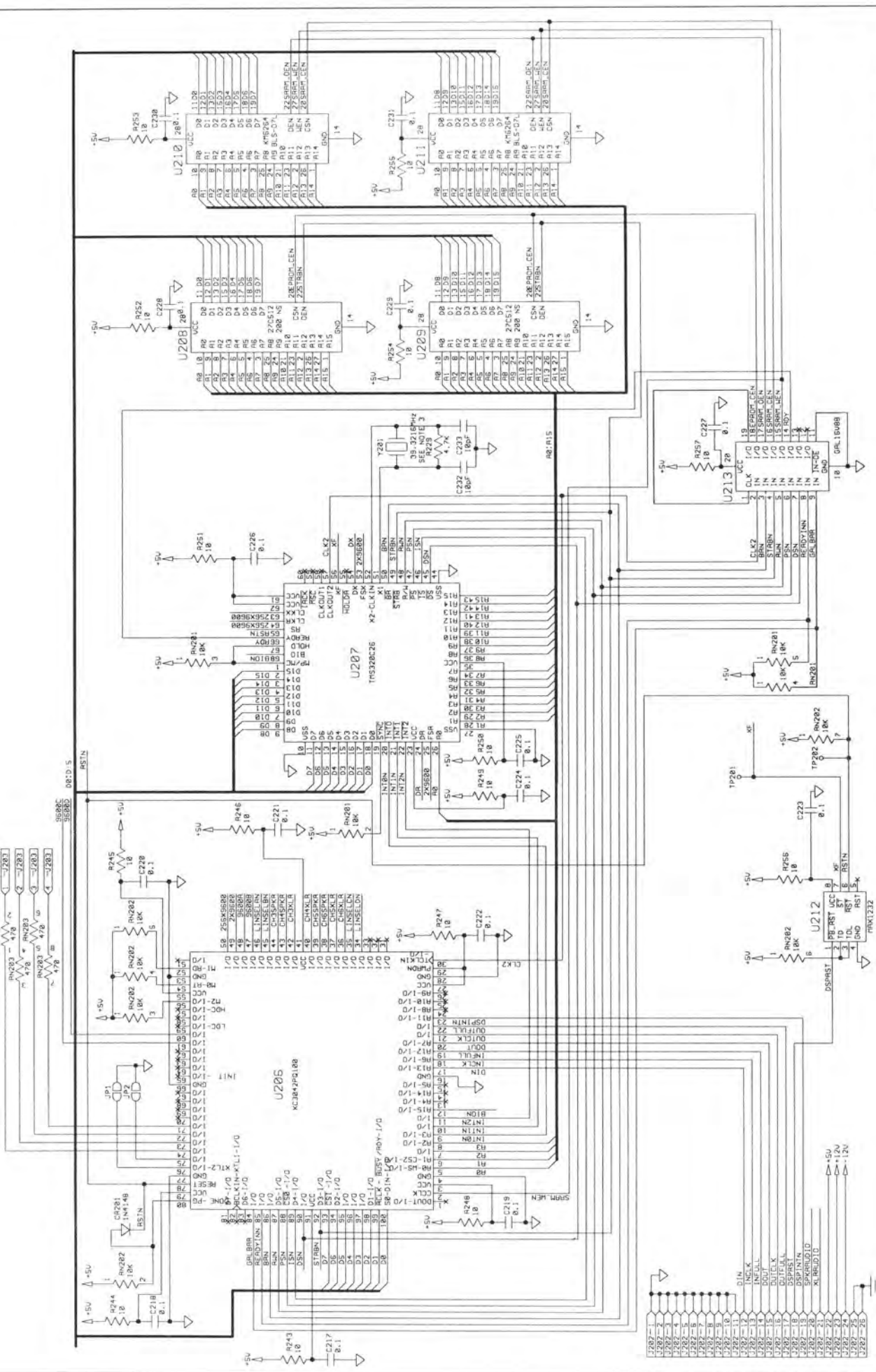
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Figure 10 (Sheet 1 Of 3)



NOTE:  
 1. COMPONENTS ON THIS PAGE NOT USED ON DUPL  
 AUDIO EXPANDER (5608-4045).

Figure 10 (Sheet 2 Of 3)



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[www.SteamPoweredRadio.Com](http://www.SteamPoweredRadio.Com)

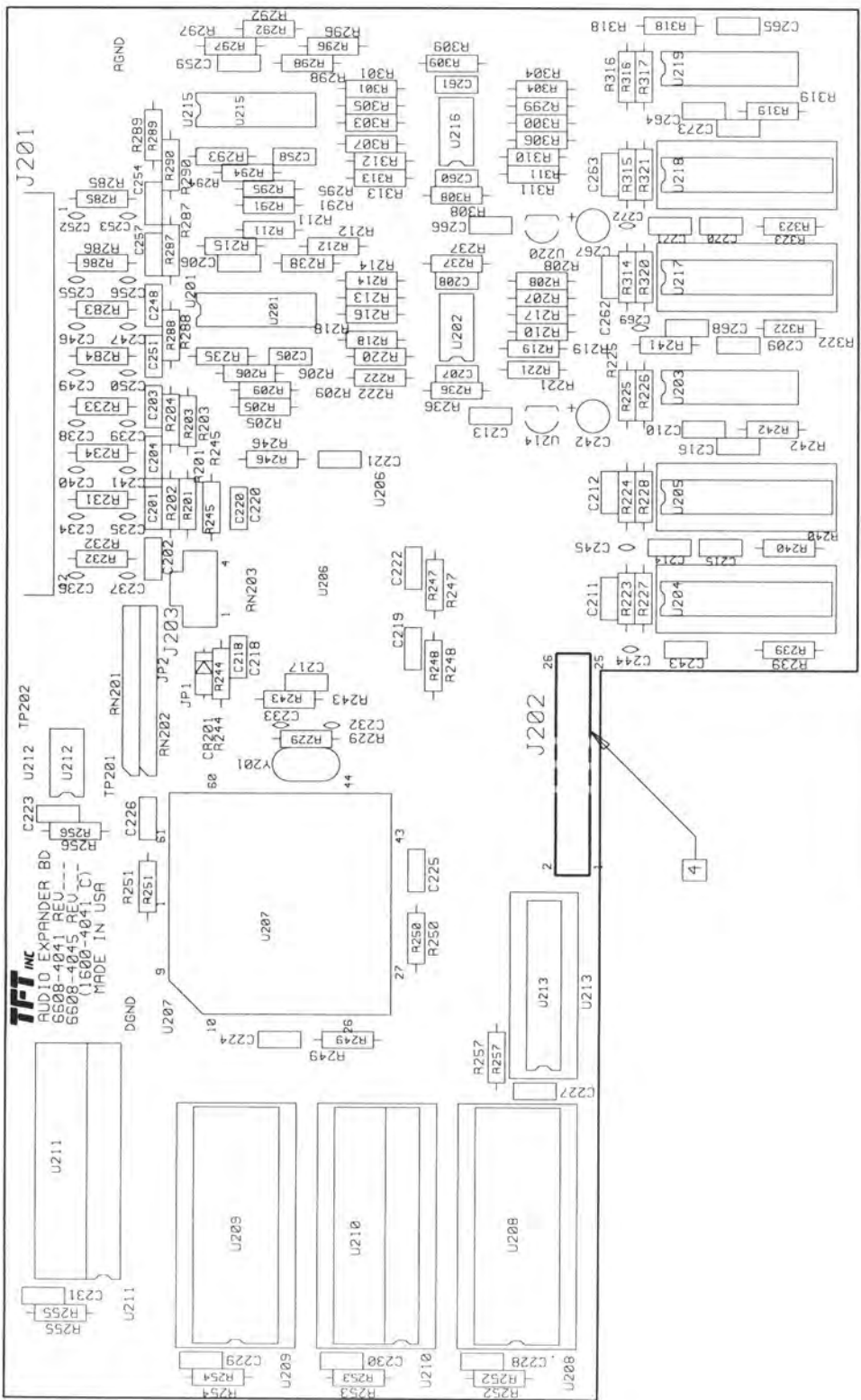
Figure 10 (Sheet 3 of 3)



REVISIONS

REV	DATE	APPROVED
C	10-01-96	

ADD ASSY REV TO SILK



**TPT INC**  
 3090 ORKMEAD VILLAGE DR.,  
 SANTA CLARA, CA 95051  
 (408) 727-7272

ASSEMBLY DRAWING,  
 QUAD AUDIO EXPANDER

SIZE DWG. NO. 6608-4041  
 REV C

SCALE: NONE  
 SHEET 1 OF 1

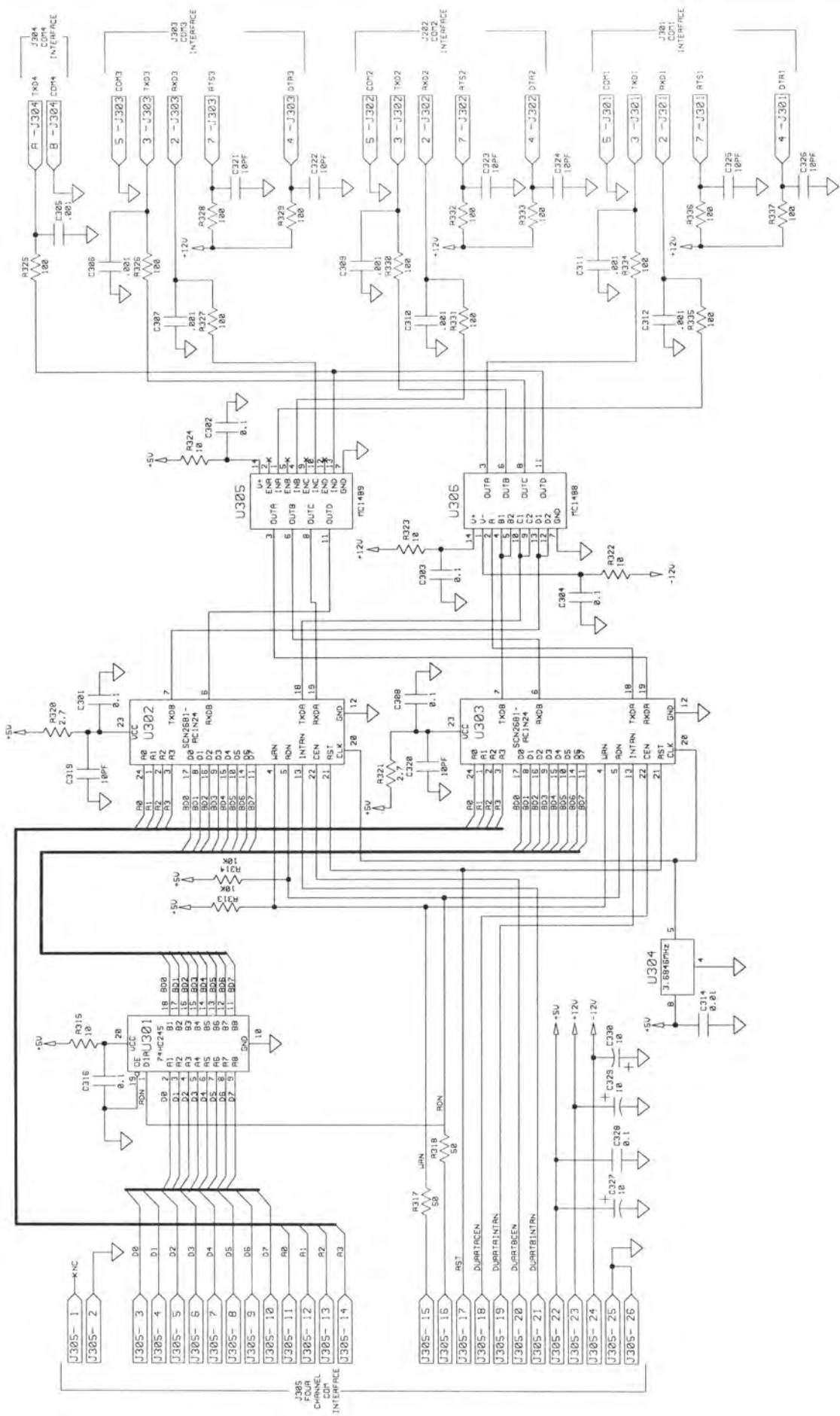
APPROVALS	DATE
DARRIN JO ANN L.	10-02-96
CHECKED	
ENG'R.	
MFG	
Q.R.	

APPLICATION
ERS 911T6 5102-3974
ERS 911R6 5102-3973
MODEL NEXT ASSY

- NOTES:
1. ALL CAPS TO BE FLUSH TO PCB.
  2. MAXIMUM LEAD HEIGHT NOT TO EXCEED .075.
  3. ADD CURRENT REV LETTER TO ASSY NO. 6608-4041.
  4. CONNECTOR J202 TO BE INSTALLED ON SOLDER SIDE.

Figure 11

REV	DESCRIPTION	DATE	APPROVED
A	PROTOTYPE RELEASE	10/15/93	
B	RELEASE MODIFIED C330	7/15/96	



REV	DESCRIPTION	DATE	APPROVED
A	PROTOTYPE RELEASE	10/15/93	
B	RELEASE MODIFIED C330	7/15/96	

REV	DESCRIPTION	DATE	APPROVED
A	PROTOTYPE RELEASE	10/15/93	
B	RELEASE MODIFIED C330	7/15/96	

REV	DESCRIPTION	DATE	APPROVED
A	PROTOTYPE RELEASE	10/15/93	
B	RELEASE MODIFIED C330	7/15/96	

REV	DESCRIPTION	DATE	APPROVED
A	PROTOTYPE RELEASE	10/15/93	
B	RELEASE MODIFIED C330	7/15/96	

REV	DESCRIPTION	DATE	APPROVED
A	PROTOTYPE RELEASE	10/15/93	
B	RELEASE MODIFIED C330	7/15/96	

3000 SHERWOOD VILLAGE DR  
 SUITE 100  
 RICHMOND, VA 23261  
 (804) 727-1772

SCHEMATIC  
 COM PORT EXPANDER

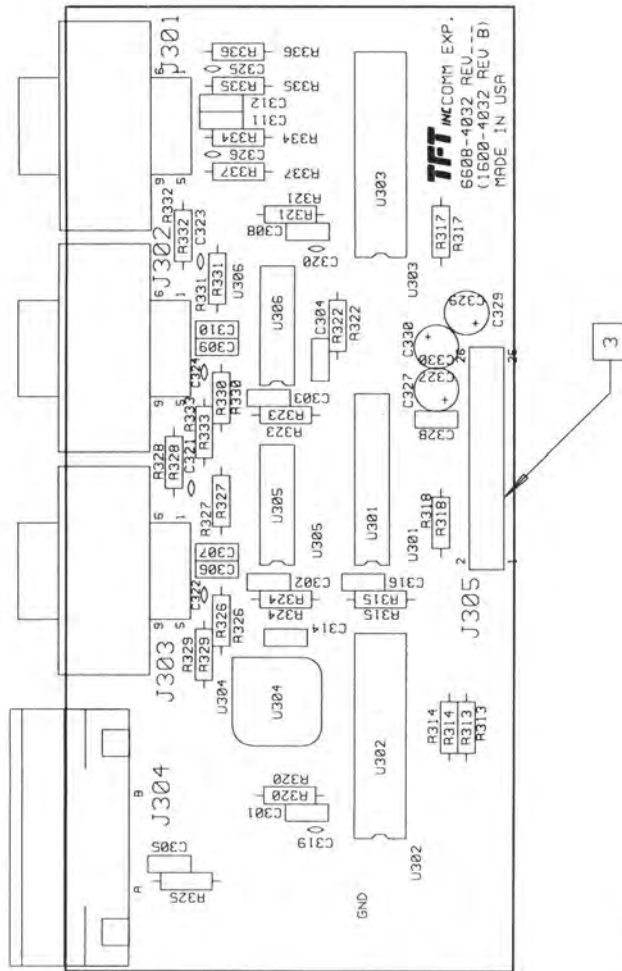
DATE: 10/15/93  
 DRAWN: JMM  
 CHECKED: JMM  
 SCALE: NONE  
 SHEET: 1 OF 1

Figure 12

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REVISIONS

REV	DATE	APPROVED
B	7-18-96	
B1	8-27-96	



NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL CAPS TO BE FLUSH ON PCB.
2. MAXIMUM LEAD HEIGHT NOT TO EXCEED .075".

3. INSTALL CONNECTOR J305 ON SOLDER SIDE OF PCB.

APPROVALS	DATE
DRAWN: JO ANN	8-27-96
CHECKED:	
ENGR.:	
TFG	
D. P.	

ERS 911T	5102-3959
ERS 911R	5102-3958
ERS 911	5102-3953
MODEL	NEXT ASSY
APPLICATION	

**TFP INC.** 3050 ORKMEAD VILLAGE DR.  
SANTA CLARA, CA 95051  
(408) 727-7272 FAX 910-338-6584

ASSEMBLY DRAWING 1  
4 PORT RS-232 COM EXPANDER

REV B1  
REV B1  
SIZE A  
Dwg. NO. 6608-4032  
SCALE: NONE SHEET 1 OF 1

Figure 13

**APPENDIX B**  
**PARTS LISTS**

TITLE	DWG NO.	REV.
Main PCB .....	6608-4030	E
Encoder PCB .....	6608-4027	C
Decoder PCB .....	6608-4028	C
Voice Recorder PCB .....	6608-4016	E
Quad Audio Expander PCB.....	6608-4041	B
4-Port COM Expander PCB .....	6608-4032	B

CKT REF	DESCRIPTION	TFT PART NO.
C001	CAP CER DISC 1MFD	1005-0001CEAS
C002	CAP CER DISC 1MFD	1005-0001CEAS
C003	CAP CER DISC 1MFD	1005-0001CEAS
C004	CAP CER DISC 1MFD	1005-0001CEAS
C005	CAP CER .01MF CK05BX103K	1015-0002CEAS
C006	CAP CER .01MF CK05BX103K	1015-0002CEAS
C007	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C008	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C009	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C010	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C011	CAP CER DISC 1MFD	1005-0001CEAS
C012	CAP CER DISC 1MFD	1005-0001CEAS
C013	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C015	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C016	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C017	CAP CER DISC 1MFD	1005-0001CEAS
C019	CAP CER DISC 1MFD	1005-0001CEAS
C020	CAP CER DISC 1MFD	1005-0001CEAS
C021	CAP CER DISC 1MFD	1005-0001CEAS
C022	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C023	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C024	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C025	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C026	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C027	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C028	CAP CER .01MF CK05BX103K	1015-0002CEAS
C030	CAP ELEC 470MF 25V VERT MNT	1010-0045CEAS
C035	CAP ALUM ELECT 220MFD 16V	1010-0202CEAS
C036	CAP CER .01MF CK05BX103K	1015-0002CEAS
C037	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C038	CAP CER .01MF CK05BX103K	1015-0002CEAS
C039	CAP CER .01MF CK05BX103K	1015-0002CEAS
C040	CAP CER .01MF CK05BX103K	1015-0002CEAS
C041	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C042	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C043	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C044	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C045	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C046	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C047	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C048	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C049	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C050	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C051	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C052	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C053	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C056	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C057	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C058	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C059	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C060	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C061	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C062	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C063	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C064	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C065	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C066	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C067	CAP CER 0.001MF CK05	1015-0010CEAS
C068	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C069	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C070	CAP ELEC 10MFD 25V NP V MT	1010-0013CEAS
C071	CAP ELEC 10MFD 25V NP V MT	1010-0013CEAS
C072	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C073	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C074	CAP 1.0 MFD 50V (NO SUB.)	1010-0021CEAS
C075	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C076	CAP CER .01MF CK05BX103K	1015-0002CEAS
C077	CAP CER .01MF CK05BX103K	1015-0002CEAS
C078	CAP CER .01MF CK05BX103K	1015-0002CEAS
C079	CAP MINI CER 100PF NPO RECT	1017-1000CEAS

CKT REF	DESCRIPTION	TFT PART NO.
C080	CAP MONO CER 680PF	1016-0681CEAS
C081	CAP MONO CER 680PF	1016-0681CEAS
C082	CAP MONO CER 680PF	1016-0681CEAS
C083	CAP MONO CER 680PF	1016-0681CEAS
C084	CAP MONO CER 680PF	1016-0681CEAS
C085	CAP MONO CER 680PF	1016-0681CEAS
C086	CAP MONO CER 680PF	1016-0681CEAS
C087	CAP MONO CER 680PF	1016-0681CEAS
C088	CAP CER DISC 1MFD	1005-0001CEAS
C089	CAP CER DISC 1MFD	1005-0001CEAS
C090	CAP CER DISC 1MFD	1005-0001CEAS
C091	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C092	CAP CER 0.001MF CK05	1015-0010CEAS
C093	CAP CER DISC 1MFD	1005-0001CEAS
C094	CAP CER DISC 1MFD	1005-0001CEAS
C095	CAP CER DISC 1MFD	1005-0001CEAS
C096	CAP CER 0.001MF CK05	1015-0010CEAS
C097	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C098	CAP CER DISC 1MFD	1005-0001CEAS
C099	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C100	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C101	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C102	CAP MONO CER 680PF	1016-0681CEAS
C103	CAP MONO CER 680PF	1016-0681CEAS
C104	CAP MONO CER 680PF	1016-0681CEAS
C105	CAP MONO CER 680PF	1016-0681CEAS
C106	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C107	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C108	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C109	CAP CER .01MF CK05BX103K	1015-0002CEAS
C110	CAP CER .01MF CK05BX103K	1015-0002CEAS
C111	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C112	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C113	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C114	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C115	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C116	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C117	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C118	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C119	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C120	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C121	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C124	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C125	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C126	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C127	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C128	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C129	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C130	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C131	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C132	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C133	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C134	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C135	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C136	CAP MINI CER 100PF NPO RECT	1017-1000CEAS
C137	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C138	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C139	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C140	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C141	CAP CER .01MF CK05BX103K	1015-0002CEAS
C142	CAP CER .01MF CK05BX103K	1015-0002CEAS
C143	CAP CER .01MF CK05BX103K	1015-0002CEAS
C144	CAP MINI CER 6.8PF	1017-0068CEAS
C145	CAP MINI CER 6.8PF	1017-0068CEAS
D001	1N4148 DIODE	1281-4148CEAS
D002	1N4148 DIODE	1281-4148CEAS
D003	1N4148 DIODE	1281-4148CEAS
D004	1N4148 DIODE	1281-4148CEAS
D005	1N4148 DIODE	1281-4148CEAS
D006	1N4148 DIODE	1281-4148CEAS

CKT REF	DESCRIPTION	TFT PART NO.
J100	2 PIN .100 CTR STRAIGHT MALE CONN	2250-5829CEAS
J101	PQG3MRA112 3 PIN R/A MALE PC CO	2220-3701CEAS
J102	6 PIN .200 CTR PLUG CONN	1700-5006EAS
J103	9 PIN D SUB R/A MALE CONN	2250-1627EAS
J104	9 PIN D SUB R/A MALE CONN	2250-1627EAS
J105	2 PIN .200 CTR PLUG CONN	1700-1202EAS
J106	2 PIN .200 CTR PLUG CONN	1700-1202EAS
J107	2 PIN .200 CTR PLUG CONN	1700-1202EAS
J108	DC POWER JACK, PC MOUNT	2140-0087EAS
J109	2 PIN .200 CTR PLUG CONN	1700-1202EAS
J111	20 PIN .1 CTR MINI MOLEX FEMALE	2250-5818EAS
J112	26 PIN DUAL/R .100 CTR ELEV SOCKET	2250-1127EAS
J113	26 PIN DUAL/R .100 CTR ELEV SOCKET	2250-1127EAS
J121	CONN 16 PIN LOW PRO PCMT 4 WALL	2250-6736CEAS
J124	PLUG 6 PIN NON LOCKING	2250-6006CEAS
J126	12PIN .100CTR FLEX CBL CONN	2250-6019EAS
J127	16 PIN .100CTR SINGLE ROW CONN	2250-5816EAS
J128	12PIN .100CTR FLEX CBL CONN	2250-6019EAS
J129	2PIN .100CTR STRAIGHT MALE CONN	2250-5829CEAS
K001	RELAY 5VDC/7A SPDT	1880-0036EAS
K002	RELAY 5VDC/7A SPDT	1880-0036EAS
L001	12UH COIL	1530-0120CEAS
PCB1	MAIN BD EAS911	1600-4030EAS
Q001	TRANS PN2222A NPN	1271-2223CEAS
Q002	TRANS PN2222A NPN	1271-2223CEAS
R001	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R002	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R003	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R004	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R005	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R006	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R007	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R008	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R009	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R010	RES CAR COMP 1/4W 5% 2K	1065-2001CEAS
R011	RES CAR FILM 1/4W 5% 620 OHM	1065-0620CEAS
R012	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R013	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R014	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R015	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R016	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R017	RES CAR COMP 1/4W 5% 2K	1065-2001CEAS
R018	RES CAR FILM 1/4W 5% 620 OHM	1065-0620CEAS
R019	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R020	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R021	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R022	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R025	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R026	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R027	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R028	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R029	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R030	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R031	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R032	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R033	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R034	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R035	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R036	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R039	RES CAR FILM 4.7K 1/4W 5%	1065-4701CEAS
R043	RES CAR FILM 4.7K 1/4W 5%	1065-4701CEAS
R044	RES CAR FILM 1/4W 5% 390 OHM	1065-0390CEAS
R045	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R046	RES CAR FILM 4.7K 1/4W 5%	1065-4701CEAS
R047	RES CAR COMP 3.6 OHM 1/2W 5%	1067-0038CEAS
R049	RES CAR FILM 1/4W 5% 1K	1065-1001CEAS
R050	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R052	RES CAR FILM 1/4W 5% 47K	1065-4702CEAS
R053	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R054	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R055	RES CAR COMP 1/4W 5% 62	1065-0062CEAS
R056	RES CAR COMP 1/4W 5% 62	1065-0062CEAS
R057	RES CAR FILM 4.7K 1/4W 5%	1065-4701CEAS
R058	RES MT FLM 1/8W 1% 1K	1061-1001CEAS
R059	RES MT FLM 1/8W 1% 1K	1061-1001CEAS

CKT REF	DESCRIPTION	TFT PART NO.
R060	RES CAR COMP 1/4W 5% 910	1065-0910CEAS
R061	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R062	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R063	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R064	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R065	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R066	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R067	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R068	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R069	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R070	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R071	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R072	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R073	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R074	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R075	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R076	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R077	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R078	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R079	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R080	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R081	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R082	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R083	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R084	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R085	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R086	RES CAR COMP 1/4W 5% 22	1065-0022CEAS
R087	RES CAR COMP 1/4W 5% 22	1065-0022CEAS
R088	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R089	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R090	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R091	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R092	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R093	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R094	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R095	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R096	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R097	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R098	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R099	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R100	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R101	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R102	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R103	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R104	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R105	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R106	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R107	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R108	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R109	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R110	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R111	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R112	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R113	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R114	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R115	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R116	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R117	RES CAR COMP 1/4W 5% 100K	1065-1003CEAS
R118	RES CAR COMP 1/4W 5% 100K	1065-1003CEAS
R119	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R120	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R121	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R122	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R123	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R124	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R125	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R126	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R127	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R128	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R129	RES CAR COMP 1/4W 5% 120	1065-0120CEAS
R130	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
RN01	100 OHM 10PIN ISOLATED SIP	1073-1010EAS
RN03	RES NETWORK 10K 10PIN SIP COM 5%	1073-1199CEAS
RN04	RESISTOR NETWORK 10K 16 PIN	1073-1003CEAS
RN05	100 OHM 10PIN ISOLATED SIP	1073-1010EAS

CKT REF	DESCRIPTION	TFT PART NO.
TP01	1/8 DX 35L YEL TEST TERMINAL	2140-0154CEAS
TP02	1/8 DX 35L YEL TEST TERMINAL	2140-0154CEAS
TP03	1/8 DX 35L YEL TEST TERMINAL	2140-0154CEAS
TP04	1/8 DX 35L YEL TEST TERMINAL	2140-0154CEAS
TP05	1/8 DX 35L YEL TEST TERMINAL	2140-0154CEAS
U001	I/C LF347N LIN QUAD OP AMP	1100-0347CEAS
U002	I/C LF353N DUAL J FET OP AMP	1100-0353CEAS
U003	ADG201AKN QUAD ANALOG SWITCH	1102-4075EAS
U004	TCM320AC37N CODEC I/C	1104-3207EAS
U005	TCM320AC37N CODEC I/C	1104-3207EAS
U006	I/C LM 78L05ACZ	1100-7806CEAS
U007	I/C LF353N DUAL J FET OP AMP	1100-0353CEAS
U008	ADG201AKN QUAD ANALOG SWITCH	1102-4075EAS
U009	ADG201AKN QUAD ANALOG SWITCH	1102-4075EAS
U010	MAX532BCPE DUAL 12 BIT (MDAC)	1104-0532EAS
U011	I/C LM386 LOW VOLT AUDIO P A	1100-0386CEAS
U012	I/C LF353N DUAL J FET OP AMP	1100-0353CEAS
U013	KC3042-70PQ100	1104-3043EAS
U014	TCM320C26BFNL DSP I/C	1104-3203EAS
U015	CLOCK DALLAS DS14285	1104-1428EAS
U016	MCM6264BP-35NS 32X SRAM 70NS	1104-6264EAS
U017	27C010-200 1MX8 EPROM	6800-0158EAS
U018	MCM6264BP-35NS 32X SRAM 70NS	1104-6264EAS
U019	27C010-200 1MX8 EPROM	6800-0159EAS
U021	MAX 1232CPA WATCH DOG TIMER	1100-0123EAS
U022	I/C MC1489N	1100-1490CEAS
U023	I/C 7406N	1100-7406CEAS
U024	MAX483CPA LO PWR RS-485 TRANS RCVR	1104-0483EAS
U025	74HC273N OCTAL D FF	1104-7427EAS
U026	74HC273N OCTAL D FF	1104-7427EAS
U027	74HC273N OCTAL D FF	1104-7427EAS
U028	74HC273N OCTAL D FF	1104-7427EAS
U029	74HC273N OCTAL D FF	1104-7427EAS
U030	MC1488N QUAD LINE DRIVER	1100-1487EAS
XJ121-1	POLARIZING KEY #3518	2251-0001CEAS
XJ121-2	POLARIZING KEY #3518	2251-0001CEAS
XU14	68 PIN PLCC SOCKET	2250-1068EAS
XU15	SOCKET I/C 24 PIN	2250-1024CEAS
XU17	32PIN .600CTR I/C SOCKET	2250-1033EAS
XU19	32PIN .600CTR I/C SOCKET	2250-1033EAS
XU20	20 PIN .3 SPACING FEMALE	2250-1052CEAS
XY01	INSULATOR FOR CRYSTAL HC-25	2140-0104CEAS
Y001	39.3216 MHZ CRYSTAL	2400-3932EAS
Y002	XTAL QUARTZ 32.768KHZ	2400-3276EAS
BATT 1	BATTERY CR2032 LITHIUM	1930-0010EAS
XBATT 1	BATTERY HOLDER COIN CELL	1930-0009EAS

CKT REF	DESCRIPTION	TFT PART NO.
C501	22 MFD 16V VERT ELECT CAP	1010-0191EAS
D501	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D502	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D503	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D504	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D505	LED SMT RED 1.5MM X 3MM PR1101W	1286-0102EAS
D506	LED SMT RED 1.5MM X 3MM PR1101W	1286-0102EAS
D507	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D508	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D509	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D510	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D511	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D512	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D513	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D514	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D515	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D516	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D517	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D518	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D519	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D520	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D521	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D522	LED SMT RED 1.5MM X 3MM PR1101W	1286-0102EAS
D523	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D524	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D525	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D526	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D527	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D528	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D529	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D530	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D531	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D532	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D533	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D534	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D535	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D536	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D537	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D538	LED SMT RED 1.5MM X 3MM PR1101W	1286-0102EAS
D541	LED SMT RED 1.5MM X 3MM PR1101W	1286-0102EAS
D542	2MA LED RED T-1	1285-1560EAS
J501	12PIN .100CTR FLEX CBL CONN	2250-6019EAS
PCB1	ENCODER BD EAS911	1600-4027EAS
R001	10K 1/BW 5% CHIP RES 1206 CASE	1056-1002EAS
R002	10K 1/BW 5% CHIP RES 1206 CASE	1056-1002EAS
R003	10K 1/BW 5% CHIP RES 1206 CASE	1056-1002EAS
RN501	330 OHM 16 PIN SMT	1074-3331EAS
RN502	330 OHM 16 PIN SMT	1074-3331EAS
RN503	330 OHM 16 PIN SMT	1074-3331EAS
RN504	330 OHM 16 PIN SMT	1074-3331EAS
RN505	330 OHM 16 PIN SMT	1074-3331EAS
RN506	10K 16 PIN SMT RES	1074-1003EAS
RN507	10K 16 PIN SMT RES	1074-1003EAS
RN508	10K 16 PIN SMT RES	1074-1003EAS
U501	MC74HC595AD CMOS SO IC 16PIN	1110-7495EAS
U502	MC74HC597D CEMOS SO IC	1110-7497EAS
U503	MC74HC595AD CMOS SO IC 16PIN	1110-7495EAS
U504	MC74HC597D CEMOS SO IC	1110-7497EAS
U505	MC74HC595AD CMOS SO IC 16PIN	1110-7495EAS
U506	MC74HC597D CEMOS SO IC	1110-7497EAS
U507	MC74HC595AD CMOS SO IC 16PIN	1110-7495EAS
U508	MC74HC597D CEMOS SO IC	1110-7497EAS
U509	MC74HC595AD CMOS SO IC 16PIN	1110-7495EAS
U510	MC74HC597D CEMOS SO IC	1110-7497EAS
U511	MC74HC595AD CMOS SO IC 16PIN	1110-7495EAS
U512	MC74HC597D CEMOS SO IC	1110-7497EAS

CKT REF	DESCRIPTION	TFT PART NO.
C601	22 MFD 16V VERT ELECT CAP	1010-0191EAS
D601	2MA LED RED T-1	1285-1560EAS
D602	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D603	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D604	2 MA LED YELLOW T-1	1285-1561EAS
D605	2 MA LED YELLOW T-1	1285-1561EAS
D606	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
D607	2 MA LED YELLOW T-1	1285-1561EAS
D608	2 MA LED YELLOW T-1	1285-1561EAS
D609	2 MA LED YELLOW T-1	1285-1561EAS
D610	2 MA LED YELLOW T-1	1285-1561EAS
D611	2 MA LED YELLOW T-1	1285-1561EAS
D612	LED SMT YEL 1.5MM X 3MM PY1101W	1286-0101EAS
J601	12PIN .100CTR FLEX CBL CONN	2250-6019EAS
PCB1	DECODER BD EAS911	1600-4028EAS
R001	10K 1/8W 5% CHIP RES 1206 CASE	1056-1002EAS
RN601	330 OHM 16 PIN SMT	1074-3331EAS
RN602	330 OHM 16 PIN SMT	1074-3331EAS
RN603	10K 16 PIN SMT RES	1074-1003EAS
U601	MC74HC595AD CMOS SO IC 16PIN	1110-7495EAS
U602	MC74HC597D CEMOS SO IC	1110-7497EAS
U603	MC74HC595AD CMOS SO IC 16PIN	1110-7495EAS
U604	MC74HC597D CEMOS SO IC	1110-7497EAS

## MODEL EAS 911 VOICE RECORDER PCB(cont'd) Assy No. 6608-4016 REV. E

CKT REF	DESCRIPTION	TFT PART NO.
B001	3.6V NI CAD CELL BATT 3V6OR	1930-0008EAS
C001	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C002	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C003	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C004	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C005	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C007	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C008	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C009	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C010	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C011	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C012	CAP ELEC 10MFD 25V NP V MT	1010-0013CEAS
C013	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C014	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C015	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C016	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C017	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C018	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C019	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C020	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C021	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C022	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C023	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C024	100MFD 16V RADIAL ELECT CAP	1010-0112EAS
C025	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C026	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C027	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C028	1MFD 35V CHIP ELECT CAP TEH SR	1013-0010EAS
C029	CAP CHIP 47PF 500V	1009-0470CEAS
C030	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
C031	.0033MFD CHIP CAP X7R	1009-0332EAS
C033	CAP CER .33MF CK068XK	1015-0011CEAS
C034	0.1UF 10% X7R CHIP CAP 1206	1009-1005EAS
CR01	1N4004 SMD DIODE DO-214	1286-4004EAS
J001	20 PIN .1 CTR MINI MOLEX MALE	2250-8820EAS

CKT REF	DESCRIPTION	TFT PART NO.
PCB1	VOICE RECORDER BD	1600-4016EAS
R001	47K 1/8W 5% CHIP RES 1206 CASE	1056-4702EAS
R002	47K 1/8W 5% CHIP RES 1206 CASE	1056-4702EAS
R003	820K OHM 1.8W 5% CHIP 1206	1056-8203EAS
R004	4.7K 1/8W 5% CHIP RES 1206 CASE	1056-4701EAS
R005	2.2K CHIP RESISTOR 1206 CASE	1056-2201EAS
R006	150K 1/8W 5% CHIP RES 1206	1056-1503EAS
R007	100K 1/8W 5% CHIP RES 1206 CASE	1056-1003EAS
R008	82K OHM 1/8W 5% CHIP RES 1206 CASE	1056-8202EAS
R009	620 OHM 1/8W 5% CHIP 1206 CASE	1056-0620EAS
R010	240 OHM 1/8W 5% CHIP RES 1206	1056-2400EAS
R011	100K 1/8W 5% CHIP RES 1206	1056-1003EAS
R012	10K 1/8W 5% CHIP RES 1206 CASE	1056-1002EAS
R013	10K 1/8W 5% CHIP RES 1206 CASE	1056-1002EAS
R014	10K 1/8W 5% CHIP RES 1206 CASE	1056-1002EAS
R015	10K 1/8W 5% CHIP RES 1206 CASE	1056-1002EAS
R016	8.2K OHM 1/8W 5% CHIP RES 1206	1056-8201EAS
R017	15K OHM 1/8W 5% CHIP RES 1206	1056-1502EAS
R019	820K OHM 1.8W 5% CHIP 1206	1056-8203EAS
TP01	1/8D X .35L YEL TEST TERMINAL	2140-0154CEAS
TP02	1/8D X .35L YEL TEST TERMINAL	2140-0154CEAS
TP03	1/8D X .35L YEL TEST TERMINAL	2140-0154CEAS
U001	74HC273A SOIC OCTAL D FF	1110-7427EAS
U002	ADG201AKR SOIC QUAD ANALOG SW	1114-4075EAS
U003	MSM6388QFP ADPCM SLD STATE RCD	1114-6388EAS
U004	LF347 QUAD OP AMP	1104-0347EAS
U005	MSM6389QFJ VOICE REGSTER/ROM	1114-6389EAS
U006	MSM6389QFJ VOICE REGSTER/ROM	1114-6389EAS
U007	MSM6389QFJ VOICE REGSTER/ROM	1114-6389EAS
U008	MSM6389QFJ VOICE REGSTER/ROM	1114-6389EAS
U009	MSM6389QFJ VOICE REGSTER/ROM	1114-6389EAS
U010	74HC32D SOIC QUAD 2IN OR GATE	1110-7432EAS
U011	74HC32D SOIC QUAD 2IN OR GATE	1110-7432EAS
U012	I/C NE572D COMPANDOR	1100-1572EAS
U013	I/C REG +5V NEC UPC78L05	1100-4106CEAS



CTR . REF.	DESCRIPTION	TFT PART NO.
C201	CAP CER DISC 1MFD	1005-0001CEAS
C202	CAP CER DISC 1MFD	1005-0001CEAS
C203	CAP CER DISC 1MFD	1005-0001CEAS
C204	CAP CER DISC 1MFD	1005-0001CEAS
C205	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C206	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C207	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C208	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C209	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C210	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C211	CAP CER DISC 1MFD	1005-0001CEAS
C212	CAP CER DISC 1MFD	1005-0001CEAS
C213	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C214	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C215	CAP CER DISC 1MFD	1005-0001CEAS
C216	CAP CER DISC 1MFD	1005-0001CEAS
C217	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C218	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C219	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C220	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C221	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C222	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C223	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C224	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C225	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C226	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C227	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C228	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C229	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C230	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C231	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C232	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C233	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C234	CAP MONO CER 680PF	1016-0681CEAS
C235	CAP MONO CER 680PF	1016-0681CEAS
C236	CAP MONO CER 680PF	1016-0681CEAS
C237	CAP MONO CER 680PF	1016-0681CEAS
C238	CAP MONO CER 680PF	1016-0681CEAS
C239	CAP MONO CER 680PF	1016-0681CEAS
C240	CAP MONO CER 680PF	1016-0681CEAS
C241	CAP MONO CER 680PF	1016-0681CEAS
C242	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C243	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C244	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C245	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C246	CAP MONO CER 680PF	1016-0681CEAS
C247	CAP MONO CER 680PF	1016-0681CEAS
C248	CAP CER DISC 1MFD	1005-0001CEAS
C249	CAP MONO CER 680PF	1016-0681CEAS
C250	CAP MONO CER 680PF	1016-0681CEAS
C251	CAP CER DISC 1MFD	1005-0001CEAS
C252	CAP MONO CER 680PF	1016-0681CEAS
C253	CAP MONO CER 680PF	1016-0681CEAS
C254	CAP CER DISC 1MFD	1005-0001CEAS
C255	CAP MONO CER 680PF	1016-0681CEAS
C256	CAP MONO CER 680PF	1016-0681CEAS
C257	CAP CER DISC 1MFD	1005-0001CEAS
C258	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C259	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C260	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C261	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C262	CAP CER DISC 1MFD	1005-0001CEAS
C263	CAP CER DISC 1MFD	1005-0001CEAS
C264	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C265	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C266	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C267	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C268	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C269	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C270	CAP CER DISC 1MFD	1005-0001CEAS

CTR . REF.	DESCRIPTION	TFT PART NO.
C271	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C272	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C273	CAP CER DISC 1MFD	1005-0001CEAS
CR201	1N4148 DIODE	1281-4148CEAS
J201	6 PIN .200 CTR PLUG CONN	1700-5006EAS
J202	26 PIN TOP SHROUDED STRIP	2250-1129EAS
PCB1	QUAD AUDIO EXP PCB	1600-4041EAS
R201	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R202	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R203	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R204	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R205	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R206	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R207	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R208	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R209	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R210	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R211	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R212	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R213	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R214	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R215	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R216	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R217	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R218	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R219	RES CAR FILM 1/4W 5% 2K	1065-2001CEAS
R220	RES CAR FILM 1/4W 5% 2K	1065-2001CEAS
R221	RES CAR FILM 1/4W 5% 620 OHM	1065-0620CEAS
R222	RES CAR FILM 1/4W 5% 620 OHM	1065-0620CEAS
R223	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R224	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R225	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R226	RES CAR FILM 1/4W 5% 10K	1065-0620CEAS
R227	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R228	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R229	RES CAR FILM 4.7K 1/4W 5%	1065-4701CEAS
R231	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
R232	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
R233	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
R234	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
R235	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R236	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R237	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R238	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R239	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R240	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R241	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R242	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R243	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R244	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R245	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R246	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R247	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R248	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R249	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R250	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R251	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R252	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R253	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R254	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R255	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R256	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R257	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R283	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
R284	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
R285	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
R286	RES CAR FILM 1/4W 5% 100	1065-0100CEAS
R287	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R288	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R289	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS

CTR. REF.	DESCRIPTION	TFT PART NO.
R290	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R291	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R292	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R293	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R294	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R295	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R296	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R297	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R298	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R299	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R300	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R301	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R303	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R304	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R305	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R306	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R307	RES MT FLM 1/8W 1% 10K	1061-1002CEAS
R308	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R309	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R310	RES CAR FILM 1/4W 5% 2K	1065-2001CEAS
R311	RES CAR FILM 1/4W 5% 620 OHM	1065-0620CEAS
R312	RES CAR FILM 1/4W 5% 2K	1065-2001CEAS
R313	RES CAR FILM 1/4W 5% 620 OHM	1065-0620CEAS
R314	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R315	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R316	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R317	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R318	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R319	RES CAR FILM 1/4W 5% 47 OHM	1065-0047CEAS
R320	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R321	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R322	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R323	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
RN201	RES NETWORK 10K 10PIN SIP COM 5%	1073-1199CEAS
RN202	RES NETWORK 10K 10PIN SIP COM 5%	1073-1199CEAS
TP01	1/8 DX .35L BLK TEST TERMINAL	2140-0150CEAS
TP02	1/8DX 35L BRN TEST TERMINAL	2140-0151CEAS
U201	I/C LF347N LIN QUAD OP AMP	1100-0347CEAS
U202	I/C LF353N DUAL J FET OP AMP	1100-0353CEAS
U203	ADG201AKN QUAD ANALOG SWITCH	1102-4075EAS
U204	TCM320AC37N CODEC I/C	1104-3207EAS
U205	TCM320AC37N CODEC I/C	1104-3207EAS
U206	XC3042-70PQ100	1104-3043EAS
U207	TCM320C28BFNL DSP I/C	1104-3203EAS
U208	27C512-200NS EPROM 64KX8	1102-2713CEAS
U209	27C512-200NS EPROM 64KX8	1102-2713CEAS
U210	MCM6264BP-35NS 32X SRAM 70NS	1104-6264EAS
U211	MCM6264BP-35NS 32X SRAM 70NS	1104-6264EAS
U212	MAX 1232CPA WATCH DOG TIMER	1100-0123EAS
U213	GAL16V8B-15Q COMS PROG & ARRAY	1100-1681EAS
U214	I/C LM 78L05ACZ	1100-7806CEAS
U215	I/C LF347N LIN QUAD OP AMP	1100-0347CEAS
U216	I/C LF353N DUAL J FET OP AMP	1100-0353CEAS
U217	TCM320AC37N CODEC I/C	1104-3207EAS
U218	TCM320AC37N CODEC I/C	1104-3207EAS
U219	ADG201AKN QUAD ANALOG SWITCH	1102-4075EAS
U220	I/C LM 78L05ACZ	1100-7806CEAS
XU207	68 PIN PLCC SOCKET	2250-1068EAS
Y201	39.3216 MHZ CRYSTAL	2400-3932EAS

CKT REF	DESCRIPTION	TFT PART NO.
C301	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C302	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C303	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C304	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C305	CAP CER 0.001MF CK05	1015-0010CEAS
C306	CAP CER 0.001MF CK05	1015-0010CEAS
C307	CAP CER 0.001MF CK05	1015-0010CEAS
C308	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C309	CAP CER 0.001MF CK05	1015-0010CEAS
C310	CAP CER 0.001MF CK05	1015-0010CEAS
C311	CAP CER 0.001MF CK05	1015-0010CEAS
C312	CAP CER 0.001MF CK05	1015-0010CEAS
C314	CAP CER .01MF CK05BX103K	1015-0002CEAS
C316	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C319	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C320	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C321	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C322	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C323	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C324	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C325	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C326	CAP MINI CER 10PF NPO RECT	1017-0100CEAS
C327	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C328	CAP CER 0.1MF CK05BX K	1015-0001CEAS
C329	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
C330	CAP ELECT 10 MFD 25V VERT MT	1010-0099CEAS
J301	9 PIN D SUB R/A MALE CONN	2250-1627EAS
J302	9 PIN D SUB R/A MALE CONN	2250-1627EAS
J303	9 PIN D SUB R/A MALE CONN	2250-1627EAS
J304	2 PIN WIRE CON C.J-9008	2250-9008EAS
J305	26 PIN TOP SHROUDED STRIP	2250-1129EAS
PCB301	COM PORT EXPANDER BD OPT	1600-4032EAS
R313	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R314	RES CAR FILM 1/4W 5% 10K	1065-1002CEAS
R315	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R317	RES CAR COMP 1/4W 5% 51	1065-0051CEAS
R318	RES CAR COMP 1/4W 5% 51	1065-0051CEAS
R320	RES CAR COMP 1/4W 5% 2.7	1065-2700CEAS
R321	RES CAR COMP 1/4W 5% 2.7	1065-2700CEAS
R322	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R323	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R324	RES CAR FILM 1/4W 5% 10 OHM	1065-0010CEAS
R325	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R326	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R327	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R328	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R329	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R330	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R331	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R332	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R333	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R334	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R335	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R336	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
R337	RES CAR COMP 1/4W 5% 100	1065-0100CEAS
U301	74HC245N I/C PLASTIC DIP	1104-7445EAS
U302	I/C SCN 2681AC 1N24	1104-0024EAS
U303	I/C SCN 2681AC 1N24	1104-0024EAS
U304	3.6864 MHZ CLOCK OSCILLATORS	2450-3686EAS
U305	I/C MC1489N	1100-1490CEAS
U306	MC1488N QUAD LINE DRIVER	1100-1487EAS

## APPENDIX C

### FIPS CODE LISTINGS

#### How to Use the FIPS Code Listings

The Header of an EAS Alert Message contains a location code which designates the geographical area affected by the alert. The location code contains 6-digits formatted PSSCCC, where:

P indicates the county subdivision.

SS indicates the state.

CCC indicates the county.

The P digit of the location code has a range of 0 to 9 and specifies a portion of a county:

- |                   |   |
|-------------------|---|
| 1 = Northwest,    | 6 = East Central                              |
| 2 = North Central | 7 = Southwest                                 |
| 3 = Northeast,    | 8 = South Central                             |
| 4 = West Central  | 9 = Southeast                                 |
| 5 = Central       | 0 = all or an unspecified portion of a county |

The SSSCC portion of the location code designates the State and County affected by the Alert message. It uses the Federal Information Processing System (FIPS) code as described by the U.S. Department of Commerce in National Institute of Standards and Technology publication 772. Each state is assigned a 2-digit code (SS). Each county is assigned a 3-digit code (CCC). A CCC code of 000 refers to an entire State or Territory.

State FIPS codes (SS) are 2-digit ascending numbers 01 to 56 assigned to an alphabetically ordered list of states as shown in Table C-1.

Table C-1. State FIPS Codes

State	FIPS	State	FIPS	State	FIPS	State	FIPS	State	FIPS
AL	01	HI	15	MA	25	NM	35	SD	46
AK	02	ID	16	MI	26	NY	36	TN	47
AZ	04	IL	17	MN	27	NC	37	TX	48
AR	05	IN	18	MS	28	ND	38	UT	49
CA	06	IA	19	MO	29	OH	39	VT	50
CO	08	KS	20	MT	30	OK	40	VA	51
CT	09	KY	21	NE	31	OR	41	WA	53
DE	10	LA	22	NV	32	PA	42	WV	54
FL	12	ME	23	NH	33	RI	44	WS	55
GA	13	MD	24	NJ	34	SC	45	WY	56
District of Columbia - 11									

County FIPS codes are 3-digit ascending numbers 000 to 999 assigned to an alphabetically ordered list of counties within a designated state as shown in Part A.

U.S. Territories FIPS codes are 2-digit ascending numbers from 60 to 78 assigned to an alphabetically ordered list of Territories as shown in Table C-2.

Table C-2. U.S. Territories FIPS Codes

Territory	FIPS Code	Territory	FIPS Code	Territory	FIPS Code
American Samoa	60	Marshall Islands	68	Puerto Rico	72
Federated States of Micronesia	64	Northern Mariana Islands	69	U.S. Minor Outlying Islands	74
Guam	66	Palau	70	Virgin Islands	78

# FIPS CODE LISTINGS

## CONTENTS

### Part A - U. S. State/County FIPS Codes

State	Page	State	Page
Alabama .....	C-4	Montana .....	C-12
Alaska .....	C-4	Nebraska .....	C-13
Arizona .....	C-4	Nevada .....	C-13
Arkansas .....	C-4	New Hampshire .....	C-13
California .....	C-5	New Jersey .....	C-13
Colorado.....	C-5	New Mexico .....	C-13
Connecticut .....	C-5	New York .....	C-14
Delaware.....	C-5	North Carolina .....	C-14
District of Columbia.....	C-5	North Dakota .....	C-14
Florida .....	C-6	Ohio .....	C-15
Georgia .....	C-6	Oklahoma .....	C-15
Hawaii .....	C-7	Oregon .....	C-15
Idaho.....	C-7	Pennsylvania .....	C-16
Illinois.....	C-7	Rhode Island .....	C-16
Indiana .....	C-8	South Carolina .....	C-16
Iowa .....	C-8	South Dakota .....	C-16
Kansas .....	C-9	Tennessee .....	C-17
Kentucky.....	C-9	Texas .....	C-17
Louisiana .....	C-10	Utah .....	C-18
Maine .....	C-10	Vermont .....	C-18
Maryland .....	C-10	Virginia .....	C-19
Massachusetts .....	C-10	Washington .....	C-19
Michigan .....	C-10	West Virginia .....	C-19
Minnesota .....	C-11	Wisconsin .....	C-20
Mississippi .....	C-11	Wyoming .....	C-20
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### Part B - U. S. Territories FIPS Codes

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Federated States of Micronesia.....	C-23	Puerto Rico.....	C-23
Guam.....	C-23	U.S. Minor Outlying Islands.....	C-24
Marshall Islands.....	C-23	Virgin Islands.....	C-24
North Mariana Islands .....	C-23		

ALABAMA							
AUTAUGA	01001	CONECUH	01035	HOUSTON	01069	MORGAN	01103
BALDWIN	01003	COOSA	01037	JACKSON	01071	PERRY	01105
BARBOUR	01005	COVINGTON	01039	JEFFERSON	01073	PICKENS	01107
BIBB	01007	CRENSHAW	01041	LAMAR	01075	PIKE	01109
BLOUNT	01009	CULLMAN	01043	LAUDERDALE	01077	RANDOLPH	01111
BULLOCK	01011	DALE	01045	LAWRENCE	01079	RUSSELL	01113
BUTLER	01013	DALLAS	01047	LEE	01081	SAINT CLAIR	01115
CALHOUN	01015	DE KALB	01049	LIMESTONE	01083	SHELBY	01117
CHAMBERS	01017	ELMORE	01051	LOWNDES	01085	SUMTER	01119
CHEROKEE	01019	ESCAMBIA	01053	MACON	01087	TALLADEGA	01121
CHILTON	01021	ETOWAH	01055	MADISON	01089	TALLAPOOSA	01123
CHOCTAW	01023	FAYETTE	01057	MARENGO	01091	TUSCALOOSA	01125
CLARKE	01025	FRANKLIN	01059	MARION	01093	WALKER	01127
CLAY	01027	GENEVA	01061	MARSHALL	01095	WASHINGTON	01129
CLEBURNE	01029	GREENE	01063	MOBILE	01097	WILCOX	01131
COFFEE	01031	HALE	01065	MONROE	01099	WINSTON	01133
COLBERT	01033	HENRY	01067	MONTGOMERY	01101		

ALASKA							
ALEUTIANS EAST	02013	FAIRBANKS NORTH STAR	02090	MATANUSKA-SUSITNA	02170	SOUTHEAST FAIRBANKS	02240
ALEUTIANS WEST	02016	HAINES	02100	NOME	02180	VALDEZ-CORDOVA	02261
ANCHORAGE	02020	JUNEAU	02110	NORTH SLOPE	02185	WADE HAMPTON	02270
BETHEL	02050	KENAI PENINSULA	02122	NORTHWEST ARCTIC	02188	WRANGELL-PETERSBURG	02280
BRISTOL BAY	02060	KETCHIKAN GATEWAY	02130	PRINCE OF WALES-OUTER KETCHIKAN	02201	YAKUTAT	02282
DENALI	02068	KODIAK ISLAND	02150	SITKA	02220	YUKON-KOYUKUK	02290
DILLINGHAM	02070	LAKE AND PENINSULA	02164	SKAGWAY-HOONAH-ANGOON	02232		

ARIZONA							
APACHE	04001	GRAHAM	04009	NAVAJO	04017	YAVAPAI	04025
COCHISE	04003	GREENLEE	04011	PIMA	04019	YUMA	04027
COCONINO	04005	MARICOPA	04013	PINAL	04021		
GILA	04007	MOHAVE	04015	SANTA CRUZ	04023		

ARKANSAS							
ARKANSAS	05001	DALLAS	05039	LEE	05077	POPE	05115
ASHLEY	05003	DESHA	05041	LINCOLN	05079	PRAIRIE	05117
BAXTER	05005	DREW	05043	LITTLE RIVER	05081	PULASKI	05119
BENTON	05007	FAULKNER	05045	LOGAN	05083	RANDOLPH	05121
BOONE	05009	FRANKLIN	05047	LONOKE	05085	SAINT FRANCIS	05123
BRADLEY	05011	FULTON	05049	MADISON	05087	SALINE	05125
CALHOUN	05013	GARLAND	05051	MARION	05089	SCOTT	05127
CARROLL	05015	GRANT	05053	MILLER	05091	SEARCY	05129
CHICOT	05017	GREENE	05055	MISSISSIPPI	05093	SEBASTIAN	05131
CLARK	05019	HEMPSTEAD	05057	MONROE	05095	SEVIER	05133
CLAY	05021	HOT SPRING	05059	MONTGOMERY	05097	SHARP	05135
CLEBURNE	05023	HOWARD	05061	NEVADA	05099	STONE	05137
CLEVELAND	05025	INDEPENDENCE	05063	NEWTON	05101	UNION	05139
COLUMBIA	05027	IZARD	05065	OUACHITA	05103	VAN BUREN	05141

### ARKANSAS (Continued)

CONWAY	05029	JACKSON	05067	PERRY	05105	WASHINGTON	05143
CRAIGHEAD	05031	JEFFERSON	05069	PHILLIPS	05107	WHITE	05145
CRAWFORD	05033	JOHNSON	05071	PIKE	05109	WOODRUFF	05147
CRITTENDEN	05035	LAFAYETTE	05073	POINSETT	05111	YELL	05149
CROSS	05037	LAWRENCE	05075	POLK	05113		

### CALIFORNIA

ALAMEDA	06001	KINGS	06031	PLACER	06061	SIERRA	06091
ALPINE	06003	LAKE	06033	PLUMAS	06063	SISKIYOU	06093
AMADOR	06005	LASSEN	06035	RIVERSIDE	06065	SOLANO	06095
BUTTE	06007	LOS ANGELES	06037	SACRAMENTO	06067	SONOMA	06097
CALAVERAS	06009	MADERA	06039	SAN BENITO	06069	STANISLAUS	06099
COLUSA	06011	MARIN	06041	SAN BERNARDINO	06071	SUTTER	06101
CONTRA COSTA	06013	MARIPOSA	06043	SAN DIEGO	06073	TEHAMA	06103
DEL NORTE	06015	MENDOCINO	06045	SAN FRANCISCO	06075	TRINITY	06105
EL DORADO	06017	MERCED	06047	SAN JOAQUIN	06077	TULARE	06107
FRESNO	06019	MODOC	06049	SAN LUIS OBISPO	06079	TUOLUMNE	06109
GLENN	06021	MONO	06051	SAN MATEO	06081	VENTURA	06111
HUMBOLDT	06023	MONTEREY	06053	SANTA BARBARA	06083	YOLO	06113
IMPERIAL	06025	NAPA	06055	SANTA CLARA	06085	YUBA	06115
INYO	06027	NEVADA	06057	SANTA CRUZ	06087		
KERN	06029	ORANGE	06059	SHASTA	06089		

### COLORADO

ADAMS	08001	DOLORES	08033	LAKE	08065	PITKIN	08097
ALAMOSA	08003	DOUGLAS	08035	LA PLATA	08067	PROWERS	08099
ARAPAHOE	08005	EAGLE	08037	LARIMER	08069	PUEBLO	08101
ARCHULETA	08007	ELBERT	08039	LAS ANIMAS	08071	RIO BLANCO	08103
BACA	08009	EL PASO	08041	LINCOLN	08073	RIO GRANDE	08105
BENT	08011	FREMONT	08043	LOGAN	08075	ROUTT	08107
BOULDER	08013	GARFIELD	08045	MESA	08077	SAGUACHE	08109
CHAFFEE	08015	GILPIN	08047	MINERAL	08079	SAN JUAN	08111
CHEYENNE	08017	GRAND	08049	MOFFAT	08081	SAN MIGUEL	08113
CLEAR CREEK	08019	GUNNISON	08051	MONTEZUMA	08083	SEDGWICK	08115
CONEJOS	08021	HINSDALE	08053	MONTROSE	08085	SUMMIT	08117
COSTILLA	08023	HUERFANO	08055	MORGAN	08087	TELLER	08119
CROWLEY	08025	JACKSON	08057	OTERO	08089	WASHINGTON	08121
CUSTER	08027	JEFFERSON	08059	OURAY	08091	WELD	08123
DELTA	08029	KIOWA	08061	PARK	08093	YUMA	08125
DENVER	08031	KIT CARSON	08063	PHILLIPS	08095		

### CONNECTICUT

FAIRFIELD	09001	LITCHFIELD	09005	NEW HAVEN	09009	TOLLAND	09013
HARTFORD	09003	MIDDLESEX	09007	NEW LONDON	09011	WINDHAM	09015

### DELAWARE

KENT	10001	NEW CASTLE	10003	SUSSEX	10005		
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### DISTRICT OF COLUMBIA

11001



### FLORIDA

ALACHUA	12001	FLAGLER	12035	LAKE	12069	PINELLAS	12103
BAKER	12003	FRANKLIN	12037	LEE	12071	POLK	12105
BAY	12005	GADSDEN	12039	LEON	12073	PUTNAM	12107
BRADFORD	12007	GILCHRIST	12041	LEW	12075	SAINT JOHNS	12109
BREVARD	12009	GLADES	12043	LIBERTY	12077	SAINT LUCIE	12111
BROWARD	12011	GULF	12045	MADISON	12079	SANTA ROSA	12113
CALHOUN	12013	HAMILTON	12047	MANATEE	12081	SARASOTA	12115
CHARLOTTE	12015	HARDEE	12049	MARION	12083	SEMINOLE	12117
CITRUS	12017	HENDRY	12051	MARTIN	12085	SUMTER	12119
CLAY	12019	HERNANDO	12053	MONROE	12087	SUWANNEE	12121
COLLIER	12021	HIGHLANDS	12055	NASSAU	12089	TAYLOR	12123
COLUMBIA	12023	HILLSBOROUGH	12057	OKALOOSA	12091	UNION	12125
DADE	12025	HOLMES	12059	OKEECHOBEE	12093	VOLUSIA	12127
DE SOTO	12027	INDIAN RIVER	12061	ORANGE	12095	WAKULLA	12129
DIXIE	12029	JACKSON	12063	OSCEOLA	12097	WALTON	12131
DWAL	12031	JEFFERSON	12065	PALM BEACH	12099	WASHINGTON	12133
ESCAMBIA	12033	LAFAYETTE	12067	PASCO	12101		

### GEORGIA

APPLING	13001	DADE	13083	JEFFERSON	13163	RICHMOND	13245
ATKINSON	13003	DAWSON	13085	JENKINS	13165	ROCKDALE	13247
BACON	13005	DECATUR	13087	JOHNSON	13167	SCHLEY	13249
BAKER	13007	DE KALB	13089	JONES	13169	SCREVEN	13251
BALDWIN	13009	DODGE	13091	LAMAR	13171	SEMINOLE	13253
BANKS	13011	DOOLY	13093	LANIER	13173	SPALDING	13255
BARROW	13013	DOUGHERTY	13095	LAURENS	13175	STEPHENS	13257
BARTOW	13015	DOUGLAS	13097	LEE	13177	STEWART	13259
BEN HILL	13017	EARLY	13099	LIBERTY	13179	SUMTER	13261
BERRIEN	13019	ECHOLS	13101	LINCOLN	13181	TALBOT	13263
BIBB	13021	EFFINGHAM	13103	LONG	13183	TALIAFERRO	13265
BLECKLEY	13023	ELBERT	13105	LOWNDES	13185	TATTNALL	13267
BRANTLEY	13025	EMANUEL	13107	LUMPKIN	13187	TAYLOR	13269
BROOKS	13027	EVANS	13109	MCDUFFIE	13189	TELFAR	13271
BRYAN	13029	FANNIN	13111	MCINTOSH	13191	TERRELL	13273
BULLOCH	13031	FAYETTE	13113	MACON	13193	THOMAS	13275
BURKE	13033	FLOYD	13115	MADISON	13195	TIFT	13277
BUTTS	13035	FORSYTH	13117	MARION	13197	TOOMBS	13279
CALHOUN	13037	FRANKLIN	13119	MERIWETHER	13199	TOWNS	13281
CAMDEN	13039	FULTON	13121	MILLER	13201	TREUTLEN	13283
CANDLER	13043	GILMER	13123	MITCHELL	13205	TROUP	13285
CARROLL	13045	GLASCOCK	13125	MONROE	13207	TURNER	13287
CATOOSA	13047	GLYNN	13127	MONTGOMERY	13209	TWIGGS	13289
CHARLTON	13049	GORDON	13129	MORGAN	13211	UNION	13291
CHATHAM	13051	GRADY	13131	MURRAY	13213	UPSON	13293
CHATTAHOOCHEE	13053	GREENE	13133	MUSCOGEE	13215	WALKER	13295

**GEORGIA (Continued)**

CHATTOOGA	13055	GWINNETT	13135	NEWTON	13217	WALTON	13297
CHEROKEE	13057	HABERSHAM	13137	OCONEE	13219	WARE	13299
CLARKE	13059	HALL	13139	OGLETHORPE	13221	WARREN	13301
CLAY	13061	HANCOCK	13141	PAULDING	13223	WASHINGTON	13303
CLAYTON	13063	HARALSON	13143	PEACH	13225	WAYNE	13305
CLINCH	13065	HARRIS	13145	PICKENS	13227	WEBSTER	13307
COBB	13067	HART	13147	PIERCE	13229	WHEELER	13309
COFFEE	13069	HEARD	13149	PIKE	13231	WHITE	13311
COLQUITT	13071	HENRY	13151	POLK	13233	WHITFIELD	13313
COLUMBUS	13073	HOUSTON	13153	PULASKI	13235	WILCOX	13315
COOK	13075	IRWIN	13155	PUTNAM	13237	WILKES	13317
COWETA	13077	JACKSON	13157	QUITMAN	13239	WILKINSON	13319
CRAWFORD	13079	JASPER	13159	RABUN	13241	WORTH	13321
CRISP	13081	JEFF DAVIS	13161	RANDOLPH	13243		

**HAWAII**

HAWAII	15001	KALAWAO	15005	KAUAI	15007	MAUI	15009
HONOLULU	15003						

**IDAHO**

ADA	16001	BUTTE	16023	GEM	16045	MINIDOKA	16067
ADAMS	16003	CAMAS	16025	GOODING	16047	NEZ PERCE	16069
BANNOCK	16005	CANYON	16027	IDAHO	16049	ONEIDA	16071
BEAR LAKE	16007	CARIBOU	16029	JEFFERSON	16051	OWYHEE	16073
BENEWAH	16009	CASSIA	16031	JEROME	16053	PAYETTE	16075
BINGHAM	16011	CLARK	16033	KOOTENAI	16055	POWER	16077
BLAINE	16013	CLEARWATER	16035	LATAH	16057	SHOSHONE	16079
BOISE	16015	CUSTER	16037	LEMHI	16059	TETON	16081
BONNER	16017	ELMORE	16039	LEWIS	16061	TWIN FALLS	16083
BONNEVILLE	16019	FRANKLIN	16041	LINCOLN	16063	VALLEY	16085
BOUNDARY	16021	FREMONT	16043	MADISON	16065	WASHINGTON	16087

**ILLINOIS**

ADAMS	17001	FORD	17053	LIVINGSTON	17105	RANDOLPH	17157
ALEXANDER	17003	FRANKLIN	17055	LOGAN	17107	RICHLAND	17159
BOND	17005	FULTON	17057	MCDONOUGH	17109	ROCK ISLAND	17161
BOONE	17007	GALLATIN	17059	MCHENRY	17111	SAINT CLAIR	17163
BROWN	17009	GREENE	17061	MCLEAN	17113	SALINE	17165
BUREAU	17011	GRUNDY	17063	MACON	17115	SANGAMON	17167
CALHOUN	17013	HAMILTON	17065	MACOUPIN	17117	SCHUYLER	17169
CARROLL	17015	HANCOCK	17067	MADISON	17119	SCOTT	17171
CASS	17017	HARDIN	17069	MARION	17121	SHELBY	17173
CHAMPAIGN	17019	HENDERSON	17071	MARSHALL	17123	STARK	17175
CHRISTIAN	17021	HENRY	17073	MASON	17125	STEPHENSON	17177
CLARK	17023	IROQUOIS	17075	MASSAC	17127	TAZEWELL	17179
CLAY	17025	JACKSON	17077	MENARD	17129	UNION	17181
CLINTON	17027	JASPER	17079	MERCER	17131	VERMILION	17183
COLES	17029	JEFFERSON	17081	MONROE	17133	WABASH	17185
COOK	17031	JERSEY	17083	MONTGOMERY	17135	WARREN	17187
CRAWFORD	17033	JO DAVIESS	17085	MORGAN	17137	WASHINGTON	17189
CUMBERLAND	17035	JOHNSON	17087	MOULTRIE	17139	WAYNE	17191
DE KALB	17037	KANE	17089	OGLE	17141	WHITE	17193
DE WITT	17039	KANKAKEE	17091	PEORIA	17143	WHITESIDE	17195
DOUGLAS	17041	KENDALL	17093	PERRY	17145	WILL	17197
DU PAGE	17043	KNOX	17095	PIATT	17147	WILLEMSON	17199

ILLINOIS (Continued)							
EDGAR	17045	LAKE	17097	PIKE	17149	WINNEBAGO	17201
EDWARDS	17047	LA SALLE	17099	POPE	17151	WOODFORD	17203
EFFINGHAM	17049	LAWRENCE	17101	PULASKI	17153		
FAYETTE	17051	LEE	17103	PUTNAM	17155		

INDIANA							
ADAMS	18001	FRANKLIN	18047	LAWRENCE	18093	RUSH	18139
ALLEN	18003	FULTON	18049	MADISON	18095	SAINT JOSEPH	18141
BARTHOLOMEW	18005	GIBSON	18051	MARION	18097	SCOTT	18143
BENTON	18007	GRANT	18053	MARSHALL	18099	SHELBY	18145
BLACKFORD	18009	GREENE	18055	MARTIN	18101	SPENCER	18147
BOONE	18011	HAMILTON	18057	MIAMI	18103	STARKE	18149
BROWN	18013	HANCOCK	18059	MONROE	18105	STEUBEN	18151
CARROLL	18015	HARRISON	18061	MONTGOMERY	18107	SULLIVAN	18153
CASS	18017	HENDRICKS	18063	MORGAN	18109	SWITZERLAND	18155
CLARK	18019	HENRY	18065	NEWTON	18111	TIPPECANOE	18157
CLAY	18021	HOWARD	18067	NOBLE	18113	TIPTON	18159
CLINTON	18023	HUNTINGTON	18069	OHIO	18115	UNION	18161
CRAWFORD	18025	JACKSON	18071	ORANGE	18117	VANDERBURGH	18163
DAVISS	18027	JASPER	18073	OWEN	18119	VERMILLION	18165
DEARBORN	18029	JAY	18075	PARKE	18121	VIGO	18167
DECATUR	18031	JEFFERSON	18077	PERRY	18123	WABASH	18169
DE KALB	18033	JENNINGS	18079	PIKE	18125	WARREN	18171
DELAWARE	18035	JOHNSON	18081	PORTER	18127	WARRICK	18173
DUBOIS	18037	KNOX	18083	POSEY	18129	WASHINGTON	18175
ELKHART	18039	KOSCIUSKO	18085	PULASKI	18131	WAYNE	18177
FAYETTE	18041	LAGRANGE	18087	PUTNAM	18133	WELLS	18179
FLOYD	18043	LAKE	18089	RANDOLPH	18135	WHITE	18181
FOUNTAIN	18045	LA PORTE	18091	RIPLEY	18137	WHITLEY	18183

IOWA							
ADAIR	19001	DAVIS	19051	JEFFERSON	19101	POCAHONTAS	19151
ADAMS	19003	DECATUR	19053	JOHNSON	19103	POLK	19153
ALLAMAKEE	19005	DELAWARE	19055	JONES	19105	POTTAWATTAMIE	19155
APPANOOSE	19007	DES MOINES	19057	KEOKUK	19107	POWESHIEK	19157
AUDUBON	19009	DICKINSON	19059	KOSSUTH	19109	RINGGOLD	19159
BENTON	19011	DUBUQUE	19061	LEE	19111	SAC	19161
BLACK HAWK	19013	EMMET	19063	LINN	19113	SCOTT	19163
BOONE	19015	FAYETTE	19065	LOUISA	19115	SHELBY	19165
BREMER	19017	FLOYD	19067	LUCAS	19117	SIoux	19167
BUCHANAN	19019	FRANKLIN	19069	LYON	19119	STORY	19169
BUENA VISTA	19021	FREMONT	19071	MADISON	19121	TAMA	19171
BUTLER	19023	GREENE	19073	MAHASKA	19123	TAYLOR	19173
CALHOUN	19025	GRUNDY	19075	MARION	19125	UNION	19175
CARROLL	19027	GUTHRIE	19077	MARSHALL	19127	VAN BUREN	19177
CASS	19029	HAMILTON	19079	MILLS	19129	WAPELLO	19179
CEDAR	19031	HANCOCK	19081	MITCHELL	19131	WARREN	19181
CERRO GORDO	19033	HARDIN	19083	MONONA	19133	WASHINGTON	19183
CHEROKEE	19035	HARRISON	19085	MONROE	19135	WAYNE	19185
CHICKASAW	19037	HENRY	19087	MONTGOMERY	19137	WEBSTER	19187
CLARKE	19039	HOWARD	19089	MUSCATINE	19139	WINNEBAGO	19189
CLAY	19041	HUMBOLDT	19091	O'BRIEN	19141	WINNESHIEK	19191
CLAYTON	19043	IDA	19093	OSCEOLA	19143	WOODBURY	19193
CLINTON	19045	IOWA	19095	PAGE	19145	WORTH	19195
CRAWFORD	19047	JACKSON	19097	PALO ALTO	19147	WRIGHT	19197
DALLAS	19049	JASPER	19099	PLYMOUTH	19149		

KANSAS							
ALLEN	20001	FINNEY	20055	LOGAN	20109	ROOKS	20163
ANDERSON	20003	FORD	20057	LYON	20111	RUSH	20165
ATCHISON	20005	FRANKLIN	20059	MCPHERSON	20113	RUSSELL	20167
BARBER	20007	GEARY	20061	MARION	20115	SALINE	20169
BARTON	20009	GOVE	20063	MARSHALL	20117	SCOTT	20171
BOURBON	20011	GRAHAM	20065	MEADE	20119	SEDGWICK	20173
BROWN	20013	GRANT	20067	MIAMI	20121	SEWARD	20175
BUTLER	20015	GRAY	20069	MITCHELL	20123	SHAWNEE	20177
CHASE	20017	GREELEY	20071	MONTGOMERY	20125	SHERIDAN	20179
CHAUTAUQUA	20019	GREENWOOD	20073	MORRIS	20127	SHERMAN	20181
CHEROKEE	20021	HAMILTON	20075	MORTON	20129	SMITH	20183
CHEYENNE	20023	HARPER	20077	NEMAHA	20131	STAFFORD	20185
CLARK	20025	HARVEY	20079	NEOSHO	20133	STANTON	20187
CLAY	20027	HASKELL	20081	NESS	20135	STEVENS	20189
CLOUD	20029	HOWEMAN	20083	NORTON	20137	SUMNER	20191
COFFEY	20031	JACKSON	20085	OSAGE	20139	THOMAS	20193
COMANCHE	20033	JEFFERSON	20087	OSBORNE	20141	TREGO	20195
COWLEY	20035	JEWELL	20089	OTTAWA	20143	WABAUNSEE	20197
CRAWFORD	20037	JOHNSON	20091	PAWNEE	20145	WALLACE	20199
DECATUR	20039	KEARNY	20093	PHILLIPS	20147	WASHINGTON	20201
DICKINSON	20041	KINGMAN	20095	POTTAWATOMIE	20149	WICHITA	20203
DONIPHAN	20043	KIOWA	20097	PRATT	20151	WILSON	20205
DOUGLAS	20045	LABETTE	20099	RAWLINS	20153	WOODSON	20207
EDWARDS	20047	LANE	20101	RENO	20155	WYANDOTTE	20209
ELK	20049	LEAVENWORTH	20103	REPUBLIC	20157		
ELLIS	20051	LINCOLN	20105	RICE	20159		
ELLSWORTH	20053	LINN	20107	RILEY	20161		

KENTUCKY							
ADAIR	21001	EDMONSON	21061	KNOX	21121	NICHOLAS	21181
ALLEN	21003	ELLIOTT	21063	LARVE	21123	OHIO	21183
ANDERSON	21005	ESTILL	21065	LAUREL	21125	OLDHAM	21185
BALLARD	21007	FAYETTE	21067	LAWRENCE	21127	OWEN	21187
BARREN	21009	FLEMING	21069	LEE	21129	OWSLEY	21189
BATH	21011	FLOYD	21071	LESLIE	21131	PENDLETON	21191
BELL	21013	FRANKLIN	21073	LETCHER	21133	PERRY	21193
BOONE	21015	FULTON	21075	LEWIS	21135	PIKE	21195
BOURBON	21017	GALLATIN	21077	LINCOLN	21137	POWELL	21197
BOYD	21019	GARRARD	21079	LIVINGSTON	21139	PULASKI	21199
BOYLE	21021	GRANT	21081	LOGAN	21141	ROBERTSON	21201
BRACKEN	21023	GRAVES	21083	LYON	21143	ROCKCASTLE	21203
BREATHITT	21025	GRAYSON	21085	MCCRACKEN	21145	ROWAN	21205
BRECKINRIDGE	21027	GREEN	21087	MCCREARY	21147	RUSSELL	21207
BULLITT	21029	GREENUP	21089	MCLEAN	21149	SCOTT	21209
BUTLER	21031	HANCOCK	21091	MADISON	21151	SHELBY	21211
CALDWELL	21033	HARDIN	21093	MAGOFFIN	21153	SIMPSON	21213
CALLOWAY	21035	HARLAN	21095	MARION	21155	SPENCER	21215
CAMPBELL	21037	HARRISON	21097	MARSHALL	21157	TAYLOR	21217
CARLISLE	21039	HART	21099	MARTIN	21159	TODD	21219
CARROLL	21041	HENDERSON	21101	MASON	21161	TRIGG	21221
CARTER	21043	HENRY	21103	MEADE	21163	TRIMBLE	21223
CASEY	21045	HICKMAN	21105	MENIFEE	21165	UNION	21225
CHRISTIAN	21047	HOPKINS	21107	MERCER	21167	WARREN	21227
CLARK	21049	JACKSON	21109	METCALFE	21169	WASHINGTON	21229
CLAY	21051	JEFFERSON	21111	MONROE	21171	WAYNE	21231

<b>KENTUCKY (Continued)</b>							
CLINTON	21053	JESSAMINE	21113	MONTGOMERY	21173	WEBSTER	21233
CRITTENDEN	21055	JOHNSON	21115	MORGAN	21175	WHITLEY	21235
CUMBERLAND	21057	KENTON	21117	MUHLENBERG	21177	WOLFE	21237
DAVISS	21059	KNOTT	21119	NELSON	21179	WOODFORD	21239

<b>LOUISIANA</b>							
ACADIA	22001	EAST BATON ROUGE	22033	MADISON	22065	SAINT LANDRY	22097
ALLEN	22003	EAST CARROLL	22035	MOREHOUSE	22067	SAINT MARTIN	22099
ASCENSION	22005	EAST FELICIANA	22037	NATCHITOCHE	22069	SAINT MARY	22101
ASSUMPTION	22007	EVANGELINE	22039	ORLEANS	22071	SAINT TAMMANY	22103
AVOUELLES	22009	FRANKLIN	22041	OUACHITA	22073	TANGIPAOHA	22105
BEAUREGARD	22011	GRANT	22043	PLAQUEMINES	22075	TENSAS	22107
BIENVILLE	22013	IBERIA	22045	POINTE COUPEE	22077	TERREBONNE	22109
BOSSER	22015	IBERVILLE	22047	RAPIDES	22079	UNION	22111
CADDO	22017	JACKSON	22049	RED RIVER	22081	VERMILION	22113
CALCASIEU	22019	JEFFERSON	22051	RICHLAND	22083	VERNON	22115
CALDWELL	22021	JEFFERSON DAVIS	22053	SABINE	22085	WASHINGTON	22117
CAMERON	22023	LAFAYETTE	22055	SAINT BERNARD	22087	WEBSTER	22119
CATAHOULA	22025	LAFOURCHE	22057	SAINT CHARLES	22089	WEST BATON ROUGE	22121
CLAIBORNE	22027	LA SALLE	22059	SAINT HELENA	22091	WEST CARROLL	22123
CONCORDIA	22029	LINCOLN	22061	SAINT JAMES	22093	WEST FELICIANA	22125
DE SOTO	22031	LIVINGSTON	22063	ST JOHN THE BAPTIST	22095	WINN	22127

<b>MAINE</b>							
ANDROSCOGGIN	23001	HANCOCK	23009	OXFORD	23017	SOMERSET	23025
AROOSTOOK	23003	KENNEBEC	23011	PENOBSCOT	23019	WALDO	23027
CUMBERLAND	23005	KNOX	23013	PISCATAQUIS	23021	WASHINGTON	23029
FRANKLIN	23007	LINCOLN	23015	SAGADAHOC	23023	YORK	23031

<b>MARYLAND</b>							
ALLEGANY	24001	CARROLL	24013	HARFORD	24025	SAINT MARY'S	24037
ANNE ARUNDEL	24003	CECIL	24015	HOWARD	24027	SOMERSET	24039
BALTIMORE	24005	CHARLES	24017	KENT	24029	TALBOT	24041
BALTIMORE CITY	24510	DORCHESTER	24019	MONTGOMERY	24031	WASHINGTON	24043
CALVERT	24009	FREDERICK	24021	PRINCE GEORGE'S	24033	WICOMICO	24045
CAROLINE	24011	GARRETT	24023	QUEEN ANNE'S	24035	WORCESTER	24047

<b>MASSACHUSETTS</b>							
BARNSTABLE	25001	ESSEX	25009	MIDDLESEX	25017	SUFFOLK	25025
BERKSHIRE	25003	FRANKLIN	25011	NANTUCKET	25019	WORCESTER	25027
BRISTOL	25005	HAMPDEN	25013	NORFOLK	25021		
DUKES	25007	HAMPSHIRE	25015	PLYMOUTH	25023		

<b>MICHIGAN</b>							
ALCONA	26001	DICKINSON	26043	LAKE	26085	OCEANA	26127
ALGER	26003	EATON	26045	LAPEER	26087	OGEMAW	26129
ALLEGAN	26005	EMMET	26047	LEELANAU	26089	ONTONAGON	26131
ALPENA	26007	GENESEE	26049	LENAWEE	26091	OSCEOLA	26133
ANTHIM	26009	GLADWIN	26051	LIVINGSTON	26093	OSCODA	26135
ARENAC	26011	GOGEBIC	26053	LUCE	26095	OTSEGO	26137
BARAGA	26013	GRAND TRAVERSE	26055	MACKINAC	26097	OTTAWA	26139
BARRY	26015	GRATTIOT	26057	MACOMB	26099	PRESQUE ISLE	26141
BAY	26017	HILLSDALE	26059	MANISTEE	26101	ROSCOMMON	26143
BENZIE	26019	HOUGHTON	26061	MARQUETTE	26103	SAGINAW	26145

MICHIGAN (Continued)							
BERRIEN	26021	HURON	26063	MASON	26105	SAINT CLAIR	26147
BRANCH	26023	INGHAM	26065	MECOSTA	26107	SAINT JOSEPH	26149
CALHOUN	26025	IONIA	26067	MENOMINEE	26109	SANILAC	26151
CASS	26027	IOSCO	26069	MIDLAND	26111	SCHOOLCRAFT	26153
CHARLEVOIX	26029	IRON	26071	MISSAUKEE	26113	SHIAWASSEE	26155
CHEBOYGAN	26031	ISABELLA	26073	MONROE	26115	TUSCOLA	26157
CHIPPEWA	26033	JACKSON	26075	MONTCALM	26117	VAN BUREN	26159
CLARE	26035	KALAMAZOO	26077	MONTMORENCY	26119	WASHTENAW	26161
CLINTON	26037	KALKASKA	26079	MUSKEGON	26121	WAYNE	26163
CRAWFORD	26039	KENT	26081	NEWAYGO	26123	WEXFORD	26165
DELTA	26041	KEEWEENAW	26083	OAKLAND	26125		

MINNESOTA							
AITKIN	27001	FILLMORE	27045	MARSHALL	27089	ROCK	27133
ANOKA	27003	FREEBORN	27047	MARTIN	27091	ROSEAU	27135
BECKER	27005	GOODHUE	27049	MEEKER	27093	SAINT LOUIS	27137
BELTRAMI	27007	GRANT	27051	MILLE LACS	27095	SCOTT	27139
BENTON	27009	HENNEPIN	27053	MORRISON	27097	SHERBURNE	27141
BIG STONE	27011	HOUSTON	27055	MOWER	27099	SIBLEY	27143
BLUE EARTH	27013	HUBBARD	27057	MURRAY	27101	STEARNS	27145
BROWN	27015	ISANTI	27059	NICOLLET	27103	STEELE	27147
CARLTON	27017	ITASCA	27061	NOBLES	27105	STEVENS	27149
CARVER	27019	JACKSON	27063	NORMAN	27107	SWIFT	27151
CASS	27021	KANABEC	27065	OLMSTED	27109	TODD	27153
CHIPPEWA	27023	KANDIYOHI	27067	OTTER TAIL	27111	TRAVERSE	27155
CHISAGO	27025	KITSON	27069	PENNINGTON	27113	WABASHA	27157
CLAY	27027	KOOCHICHING	27071	PINE	27115	WADENA	27159
CLEARWATER	27029	LAC QUI PARLE	27073	PIPESTONE	27117	WASECA	27161
COOK	27031	LAKE	27075	POLK	27119	WASHINGTON	27163
COTTONWOOD	27033	LAKE OF THE WOODS	27077	POPE	27121	WATONWAN	27165
CROW WING	27035	LE SUEUR	27079	RAMSEY	27123	WILKIN	27167
DAKOTA	27037	LINCOLN	27081	RED LAKE	27125	WINONA	27169
DODGE	27039	LYON	27083	REDWOOD	27127	WRIGHT	27171
DOUGLAS	27041	MCLEOD	27085	RENVILLE	27129	YELLOW MEDICINE	27173
FARIBAULT	27043	MAHNOMEN	27087	RICE	27131		

MISSISSIPPI							
ADAMS	28001	GRENADA	28043	LINCOLN	28085	SIMPSON	28127
ALCORN	28003	HANCOCK	28045	LOWNDES	28087	SMITH	28129
AMITE	28005	HARRISON	28047	MADISON	28089	STONE	28131
ATTALA	28007	HINDS	28049	MARION	28091	SUNFLOWER	28133
BENTON	28009	HOLMES	28051	MARSHALL	28093	TALLAHATCHIE	28135
BOLIVAR	28011	HUMPHREYS	28053	MONROE	28095	TATE	28137
CALHOUN	28013	ISSAQUENA	28055	MONTGOMERY	28097	TIPPAH	28139
CARROLL	28015	ITAWAMBA	28057	NESHOBA	28099	TISHOMINGO	28141
CHICKASAW	28017	JACKSON	28059	NEWTON	28101	TUNICA	28143
CHOCTAW	28019	JASPER	28061	NOXUBEE	28103	UNION	28145
CLAIBORNE	28021	JEFFERSON	28063	OKTIBBEHA	28105	WALTHALL	28147
CLARKE	28023	JEFFERSON DAVIS	28065	PANOLA	28107	WARREN	28149
CLAY	28025	JONES	28067	PEARL RIVER	28109	WASHINGTON	28151
COAHOMA	28027	KEMPER	28069	PERRY	28111	WAYNE	28153
COPIAH	28029	LAFAYETTE	28071	PIKE	28113	WEBSTER	28155
COVINGTON	28031	LAMAR	28073	PONTOTOC	28115	WILKINSON	28157
DE SOTO	28033	LAUDERDALE	28075	PRENTISS	28117	WINSTON	28159
FORREST	28035	LAWRENCE	28077	QUITMAN	28119	YALOBUSHA	28161
FRANKLIN	28037	LEAKE	28079	RANKIN	28121	YAZOO	28163

MISSISSIPPI (Continued)							
GEORGE	28039	LEE	28081	SCOTT	28123		
GREENE	28041	LEFLORE	28083	SHARKEY	28125		

MISSOURI							
ADAIR	29001	DALLAS	29059	LIVINGSTON	29117	RANDOLPH	29175
ANDREW	29003	DAVISS	29061	MCDONALD	29119	RAY	29177
ATCHISON	29005	DE KALB	29063	MACON	29121	REYNOLDS	29179
AUDRAIN	29007	DENT	29065	MADISON	29123	RIPLEY	29181
BARRY	29009	DOUGLAS	29067	MARIES	29125	SAINT CHARLES	29183
BARTON	29011	DUNKLIN	29069	MARION	29127	SAINT CLAIR	29185
BATES	29013	FRANKLIN	29071	MERCER	29129	SAINT GENEVIEVE	29186
BENTON	29015	GASCONADE	29073	MILLER	29131	SAINT FRANCOIS	29187
BOLLINGER	29017	GENTRY	29075	MISSISSIPPI	29133	SAINT LOUIS	29189
BOONE	29019	GREENE	29077	MONITEAU	29135	SALINE	29195
BUCHANAN	29021	GRUNDY	29079	MONROE	29137	SCHUYLER	29197
BUTLER	29023	HARRISON	29081	MONTGOMERY	29139	SCOTLAND	29199
CALDWELL	29025	HENRY	29083	MORGAN	29141	SCOTT	29201
CALLAWAY	29027	HICKORY	29085	NEW MADRID	29143	SHANNON	29203
CAMDEN	29029	HOLT	29087	NEWTON	29145	SHELBY	29205
CAPE GIRARDEAU	29031	HOWARD	29089	NODAWAY	29147	STODDARD	29207
CARROLL	29033	HOWELL	29091	OREGON	29149	STONE	29209
CARTER	29035	IRON	29093	OSAGE	29151	SULLIVAN	29211
CASS	29037	JACKSON	29095	OZARK	29153	TANEY	29213
CEDAR	29039	JASPER	29097	PEMISCOT	29155	TEXAS	29215
CHARITON	29041	JEFFERSON	29099	PERRY	29157	VERNON	29217
CHRISTIAN	29043	JOHNSON	29101	PETTIS	29159	WARREN	29219
CLARK	29045	KNOX	29103	HELPS	29161	WASHINGTON	29221
CLAY	29047	LACLEDE	29105	PIKE	29163	WAYNE	29223
CLINTON	29049	LAFAYETTE	29107	PLATTE	29165	WEBSTER	29225
COLE	29051	LAWRENCE	29109	POLK	29167	WORTH	29227
COOPER	29053	LEWIS	29111	PULASKI	29169	WRIGHT	29229
CRAWFORD	29055	LINCOLN	29113	PUTNAM	29171	SAINT LOUIS CITY	29510
DADE	29057	LINN	29115	RALLS	29173		

MONTANA							
BEAVERHEAD	30001	GALLATIN	30031	MINERAL	30061	SHERIDAN	30091
BIG HORN	30003	GARFELD	30033	MISSOULA	30063	SILVER BOW	30093
BLAINE	30005	GLACIER	30035	MUSSELSHELL	30065	STILLWATER	30095
BROADWATER	30007	GOLDEN VALLEY	30037	PARK	30067	SWEET GRASS	30097
CARBON	30009	GRANITE	30039	PETROLEUM	30069	TETON	30099
CARTER	30011	HILL	30041	PHILLIPS	30071	TOOLE	30101
CASCADE	30013	JEFFERSON	30043	PONDERA	30073	TREASURE	30103
CHOUTEAU	30015	JUDITH BASIN	30045	POWDER RIVER	30075	VALLEY	30105
CUSTER	30017	LAKE	30047	POWELL	30077	WHEATLAND	30107
DANIELS	30019	LEWIS AND CLARK	30049	PRAIRIE	30079	WIBAUX	30109
DAWSON	30021	LIBERTY	30051	RAVALLI	30081	YELLOWSTONE	30111
DEER LODGE	30023	LINCOLN	30053	RICHLAND	30083	Y' STONE NAT'L PARK	30113
FALLON	30025	MCCONE	30055	ROOSEVELT	30085		
FERGUS	30027	MADISON	30057	ROSEBUD	30087		
FLATHEAD	30029	MEAGHER	30059	SANDERS	30089		

NEBRASKA							
ADAMS	31001	DEUEL	31049	JOHNSON	31097	RED WILLOW	31145
ANTELOPE	31003	DIXON	31051	KEARNEY	31099	RICHARDSON	31147
ARTHUR	31005	DODGE	31053	KEITH	31101	ROCK	31149
BANNER	31007	DOUGLAS	31055	KEYA PAHA	31103	SALINE	31151
BLAINE	31009	DUNDY	31057	KIMBALL	31105	SARPY	31153
BOONE	31011	FILLMORE	31059	KNOX	31107	SAUNDERS	31155
BOX BUTTE	31013	FRANKLIN	31061	LANCASTER	31109	SCOTTS BLUFF	31157
BOYD	31015	FRONTIER	31063	LINCOLN	31111	SEWARD	31159
BROWN	31017	FURNAS	31065	LOGAN	31113	SHERIDAN	31161
BUFFALO	31019	GAGE	3167	LOUP	31115	SHERMAN	31163
BURT	31021	GARDEN	31069	MCPHERSON	31117	SIOUX	31165
BUTLER	31023	GARFIELD	31071	MADISON	31119	STANTON	31167
CASS	31025	GOSPER	31073	MERRICK	31121	THAYER	31169
CEDAR	31027	GRANT	31075	MORRILL	31123	THOMAS	31171
CHASE	31029	GREELEY	31077	NANCE	31125	THURSTON	31173
CHERRY	31031	HALL	31079	NEMAHA	31127	VALLEY	31175
CHEYENNE	31033	HAMILTON	31081	NUCKOLLS	31129	WASHINGTON	31177
CLAY	31035	HARLAN	31083	OTOE	31131	WAYNE	31179
COLFAX	31037	HAYES	31085	PAWNEE	31133	WEBSTER	31181
CUMING	31039	HITCHCOCK	31087	PERKINS	31135	WHEELER	31183
CUSTER	31041	HOLT	31089	PHELPS	31137	YORK	31185
DAKOTA	31043	HOOKER	31091	PIERCE	31139		
DAWES	31045	HOWARD	31093	PLATTE	31141		
DAWSON	31047	JEFFERSON	31095	POLK	31143		

NEVADA							
CHURCHILL	32001	EUREKA	32011	MINERAL	32021	WHITE PINE	32033
CLARK	32003	HUMBOLDT	32013	NYE	32023	CARSON CITY	32510
DOUGLAS	32005	LANDER	32015	PERSHING	32027		
ELKO	32007	LINCOLN	32017	STOREY	32029		
ESMERALDA	32009	LYON	32019	WASHOE	32031		

NEW HAMPSHIRE							
BELKNAP	33001	COOS	33007	MERRIMACK	33013	SULLIVAN	33019
CARROLL	33003	GRAFTON	33009	ROCKINGHAM	33015		
CHESHIRE	33005	HILLSBOROUGH	33011	STRAFFORD	33017		

NEW JERSEY							
ATLANTIC	34001	ESSEX	34013	MONMOUTH	34025	SUSSEX	34037
BERGEN	34003	GLOUCESTER	34015	MORRIS	34027	UNION	34039
BURLINGTON	34005	HUDSON	34017	OCEAN	34029	WARREN	34041
CAMDEN	34007	HUNTERDON	34019	PASSAIC	34031		
CAPE MAY	34009	MERCER	34021	SALEM	34033		
CUMBERLAND	34011	MIDDLESEX	34023	SOMERSET	34035		

NEW MEXICO							
BERNALILLO	35001	GRANT	35017	MCKINLEY	35031	SAN MIGUEL	35047
CATRON	35003	GUADALUPE	35019	MORA	35033	SANTA FE	35049
CHAVES	35005	HARDING	35021	OTERO	35035	SIERRA	35051
COLFAX	35007	HIDALGO	35023	QUAY	35037	SOCORRO	35053
CURRY	35009	LEA	35025	RIO ARRIBA	35039	TAOS	35055
DE BACA	35011	LINCOLN	35027	ROOSEVELT	35041	TORRANCE	35057
DONA ANA	35013	LOS ALAMOS	35028	SANDOVAL	35043	UNION	35059
EDDY	35015	LUNA	35029	SAN JUAN	35045	VALENCIA	35061



NEW YORK							
ALBANY	36001	FRANKLIN	36033	ONEIDA	36065	SCHUYLER	36097
ALLEGANY	36003	FULTON	36035	ONONDAGA	36067	SENECA	36099
BRONX	36005	GENESEE	36037	ONTARIO	36069	STEUBEN	36101
BROOME	36007	GREENE	36039	ORANGE	36071	SUFFOLK	36103
CATTARAUGUS	36009	HAMILTON	36041	ORLEANS	36073	SULLIVAN	36105
CAYUGA	36011	HERKIMER	36043	OSWEGO	36075	TIOGA	36107
CHAUTAQUA	36013	JEFFERSON	36045	OTSEGO	36077	TOMPKINS	36109
CHEMUNG	36015	KINGS	36047	PUTNAM	36079	ULSTER	36111
CHENANGO	36017	LEWIS	36049	QUEENS	36081	WARREN	36113
CLINTON	36019	LIVINGSTON	36051	RENSSELAER	36083	WASHINGTON	36115
COLUMBIA	36021	MADISON	36053	RICHMOND	36085	WAYNE	36117
CORTLAND	36023	MONROE	36055	ROCKLAND	36087	WESTCHESTER	36119
DELAWARE	36025	MONTGOMERY	36057	ST. LAWRENCE	36089	WYOMING	36121
DUTCHESS	36027	NASSAU	36059	SARATOGA	36091	YATES	36123
ERIE	36029	NEW YORK	36061	SCHENECTADY	36093		
ESSEX	36031	NIAGARA	36063	SCHOHARIE	36095		

NORTH CAROLINA							
ALAMANCE	37001	CUMBERLAND	37051	JOHNSTON	37101	RANDOLPH	37151
ALEXANDER	37003	CURRITUCK	37053	JONES	37103	RICHMOND	37153
ALLEGHANY	37005	DARE	37055	LEE	37105	ROBESON	37155
ANSON	37007	DAVIDSON	37057	LENOIR	37107	ROCKINGHAM	37157
ASHE	37009	DAVIE	37059	LINCOLN	37109	ROWAN	37159
AVERY	37011	DUPLIN	37061	MCDOWELL	37111	RUTHERFORD	37161
BEAUFORT	37013	DURHAM	37063	MACON	37113	SAMPSON	37163
BERTE	37015	EDGEcombe	37065	MADISON	37115	SCOTLAND	37165
BLADEN	37017	FORSYTH	37067	MARTIN	37117	STANLY	37167
BRUNSWICK	37019	FRANKLIN	37069	MECKLENBURG	37119	STOKES	37169
BUNCOMBE	37021	GASTON	37071	MITCHELL	37121	SURRY	37171
BURKE	37023	GATES	37073	MONTGOMERY	37123	SWAIN	37173
CABARRUS	37025	GRAHAM	37075	MOORE	37125	TRANSYLVANIA	37175
CALDWELL	37027	GRANVILLE	37077	NASH	37127	TYRRELL	37177
CAMDEN	37029	GREENE	37079	NEW HANOVER	37129	UNION	37179
CARTERET	37031	GUILFORD	37081	NORTHAMPTON	37131	VANCE	37181
CASWELL	37033	HALIFAX	37083	ONslow	37133	WAKE	37183
CATAWBA	37035	HARNETT	37085	ORANGE	37135	WARREN	37185
CHATHAM	37037	HAYWOOD	37087	PAMLICO	37137	WASHINGTON	37187
CHEROKEE	37039	HENDERSON	37089	PASQUOTANK	37139	WATAUGA	37189
CHOWAN	37041	HERTFORD	37091	PENDER	37141	WAYNE	37191
CLAY	37043	HOKE	37093	PERQUIMANS	37143	WILKES	37193
CLEVELAND	37045	HYDE	37095	PERSON	37145	WILSON	37195
COLUMBUS	37047	IREDELL	37097	PITT	37147	YADKIN	37197
CRAVEN	37049	JACKSON	37099	POLK	37149	YANCEY	37199

NORTH DAKOTA							
ADAMS	38001	EMMONS	38029	MERCER	38057	SIoux	38085
BARNES	38003	FOSTER	38031	MORTON	38059	SLOPE	38087
BENSON	38005	GOLDENVALLEY	38033	MOUNTRAIL	38061	STARK	38089
BILLINGS	38007	GRAND FORKS	38035	NELSON	38063	STEELE	38091
BOTTINEAU	38009	GRANT	38037	OLIVER	38065	STUTSMAN	38093
BOWMAN	38011	GRIGGS	38039	PEMBINA	38067	TOWNER	38095
BURKE	38013	HETTINGER	38041	PIERCE	38069	TRAILL	38097
BURLEIGH	38015	KIDDER	38043	RAMSEY	38071	WALSH	38099
CASS	38017	LA MOURE	38045	RANSOM	38073	WARD	38101
CAVALIER	38019	LOGAN	38047	RENVILLE	38075	WELLS	38103
DICKEY	38021	MCHENRY	38049	RICHLAND	38077	WILLIAMS	38105

**NORTH DAKOTA (Continued)**

DIVIDE	38023	MCINTOSH	38051	ROLETTE	38079		
DUNN	38025	MCKENZIE	38053	SARGENT	38081		
EDDY	38027	MCLEAN	38055	SHERIDAN	38083		

**OHIO**

ADAMS	39001	FAIRFIELD	39045	LICKING	39089	PORTAGE	39133
ALLEN	39003	FAYETTE	39047	LOGAN	39091	PREBLE	39135
ASHLAND	39005	FRANKLIN	39049	LORAIN	39093	PUTNAM	39137
ASHTABULA	39007	FULTON	39051	LUCAS	39095	RICHLAND	39139
ATHENS	39009	GALLIA	39053	MADISON	39097	ROSS	39141
AUGLAIZE	39011	GEAUGA	39055	MAHONING	39099	SANDUSKY	39143
BELMONT	39013	GREENE	39057	MARION	39101	SCIOTO	39145
BROWN	39015	GUERNSEY	39059	MEDINA	39103	SENECA	39147
BUTLER	39017	HAMILTON	39061	MEIGS	39105	SHELBY	39149
CARROLL	39019	HANCOCK	39063	MERCER	39107	STARK	39151
CHAMPAIGN	39021	HARDIN	39065	MIAMI	39109	SUMMIT	39153
CLARK	39023	HARRISON	39067	MONROE	39111	TRUMBULL	39155
CLERMONT	39025	HENRY	39069	MONTGOMERY	39113	TUSCARAWAS	39157
CLINTON	39027	HIGHLAND	39071	MORGAN	39115	UNION	39159
COLUMBIANA	39029	HOCKING	39073	MORROW	39117	VAN WERT	39161
COSHOCTON	39031	HOLMES	39075	MUSKINGUM	39119	VINTON	39163
CRAWFORD	39033	HURON	39077	NOBLE	39121	WARREN	39165
CUYAHOGA	39035	JACKSON	39079	OTTAWA	39123	WASHINGTON	39167
DARKE	39037	JEFFERSON	39081	PAULDING	39125	WAYNE	39169
DEFIANCE	39039	KNOX	39083	PERRY	39127	WILLIAMS	39171
DELAWARE	39041	LAKE	39085	PICKAWAY	39129	WOOD	39173
ERIE	39043	LAWRENCE	39087	PIKE	39131	WYANDOT	39175

**OKLAHOMA**

ADAIR	40001	DELAWARE	40041	LINCOLN	40081	PITTSBURG	40121
ALFALFA	40003	DEWEY	40043	LOGAN	40083	PONTOTOC	40123
ATOKA	40005	ELLIS	40045	LOVE	40085	POTTAWATOMIE	40125
BEAVER	40007	GARFIELD	40047	MCCLAIN	40087	PUSHMATAHA	40127
BECKHAM	40009	GARVIN	40049	MCCURTAIN	40089	ROGER MILLS	40129
BLAINE	40011	GRADY	40051	MCINTOSH	40091	ROGERS	40131
BRYAN	40013	GRANT	40053	MAJOR	40093	SEMINOLE	40133
CADDO	40015	GREER	40055	MARSHALL	40095	SEQUOYAH	40135
CANADIAN	40017	HARMON	40057	MAYES	40097	STEPHENS	40137
CARTER	40019	HARPER	40059	MURRAY	40099	TEXAS	40139
CHEROKEE	40021	HASKELL	40061	MUSKOGEE	40101	TILLMAN	40141
CHOCTAW	40023	HUGHES	40063	NOBLE	40103	TULSA	40143
CIMARRON	40025	JACKSON	40065	NOWATA	40105	WAGONER	40145
CLEVELAND	40027	JEFFERSON	40067	OKFUSKEE	40107	WASHINGTON	40147
COAL	40029	JOHNSTON	40069	OKLAHOMA	40109	WASHITA	40149
COMANCHE	40031	KAY	40071	OKMULGEE	40111	WOODS	40151
COTTON	40033	KINGFISHER	40073	OSAGE	40113	WOODWARD	40153
CRAIG	40035	KIOWA	40075	OTTAWA	40115		
CREEK	40037	LATIMER	40077	PAWNEE	40117		
CUSTER	40039	LE FLORE	40079	PAYNE	40119		

**OREGON**

BAKER	41001	DOUGLAS	41019	LAKE	41037	SHERMAN	41055
BENTON	41003	GILLIAM	41021	LANE	41039	TILLAMOOK	41057
CLACKAMAS	41005	GRANT	41023	LINCOLN	41041	UMATILLA	41059
CLATSOP	41007	HARNEY	41025	LINN	41043	UNION	41061
COLUMBIA	41009	HOOD RIVER	41027	MALHEUR	41045	WALLOWA	41063

OREGON (Continued)							
COOS	41011	JACKSON	41029	MARION	41047	WASCO	41065
CROOK	41013	JEFFERSON	41031	MORROW	41049	WASHINGTON	41067
CURRY	41015	JOSEPHINE	41033	MULTNOMAH	41051	WHEELER	41069
DESCHUTES	41017	KLAMATH	41035	POLK	41053	YAMHILL	41071

PENNSYLVANIA							
ADAMS	42001	CLINTON	42035	LACKAWANNA	42069	PIKE	42103
ALLEGHENY	42003	COLUMBIA	42037	LANCASTER	42071	POTTER	42105
ARMSTRONG	42005	CRAWFORD	42039	LAWRENCE	42073	SCHUYLKILL	42107
BEAVER	42007	CUMBERLAND	42041	LEBANON	42075	SNYDER	42109
BEDFORD	42009	DAUPHIN	42043	LEHIGH	42077	SOMERSET	42111
BERKS	42011	DELAWARE	42045	LUZERNE	42079	SULLIVAN	42113
BLAIR	42013	ELK	42047	LYCOMING	42081	SUSQUEHANNA	42115
BRADFORD	42015	ERIE	42049	MCKEAN	42083	TIOGA	42117
BUCKS	42017	FAYETTE	42051	MERCER	42085	UNION	42119
BUTLER	42019	FOREST	42053	MIFFLIN	42087	VENANGO	42121
CAMBRIA	42021	FRANKLIN	42055	MONROE	42089	WARREN	42123
CAMERON	42023	FULTON	42057	MONTGOMERY	42091	WASHINGTON	42125
CARBON	42025	GREENE	42059	MONTOUR	42093	WAYNE	42127
CENTRE	42027	HUNTINGDON	42061	NORTHAMPTON	42095	WESTMORELAND	42129
CHESTER	42029	INDIANA	42063	NORTHUMBERLAND	42097	WYOMING	42131
CLARION	42031	JEFFERSON	42065	PERRY	42099	YORK	42133
CLEARFELD	42033	JUNIATA	42067	PHILADELPHIA	42101		

RHODE ISLAND							
BRISTOL	44001	NEWPORT	44005	WASHINGTON	44009		
KENT	44003	PROVIDENCE	44007				

SOUTH CAROLINA							
ABBEVILLE	45001	CHESTERFELD	45025	HAMPTON	45049	OCONEE	45073
AIKEN	45003	CLARENDON	45027	HORRY	45051	ORANGEBURG	45075
ALLENDALE	45005	COLLETON	45029	JASPER	45053	PICKENS	45077
ANDERSON	45007	DARLINGTON	45031	KERSHAW	45055	RICHLAND	45079
BAMBERG	45009	DILLON	45033	LANCASTER	45057	SALUDA	45081
BARNWELL	45011	DORCHESTER	45035	LAURENS	45059	SPARTANBURG	45083
BEAUFORT	45013	EDGEFIELD	45037	LEE	45061	SUMTER	45085
BERKELEY	45015	FAIRFELD	45039	LEXINGTON	45063	UNION	45087
CALHOUN	45017	FLORENCE	45041	MCCORMICK	45065	WILLIAMSBURG	45089
CHARLESTON	45019	GEORGETOWN	45043	MARION	45067	YORK	45091
CHEROKEE	45021	GREENVILLE	45045	MARLBORO	45069		
CHESTER	45023	GREENWOOD	45047	NEWBERRY	45071		

SOUTH DAKOTA							
		DAVISON	46035	HYDE	46069	PENNINGTON	46103
AURORA	46003	DAY	46037	JACKSON	46071	PERKINS	46105
BEADLE	46005	DEUEL	46039	IERAULD	46073	POTTER	46107
BENNETT	46007	DEWEY	46041	JONES	46075	ROBERTS	46109
BON HOMME	46009	DOUGLAS	46043	KINGSBURY	46077	SANBORN	46111
BROOKINGS	46011	EDMUNDS	46045	LAKE	46079	SHANNON	46113
BROWN	46013	FALL RIVER	46047	LAWRENCE	46081	SPINK	46115
BRULE	46015	FAULK	46049	LINCOLN	46083	STANLEY	46117
BUFFALO	46017	GRANT	46051	LYMAN	46085	SULLY	46119
BUTTE	46019	GREGORY	46053	MCCOOK	46087	TODD	46121
CAMPBELL	46021	HAAKON	46055	MCPHERSON	46089	TRIPP	46123
CHARLES MIX	46023	HAMLIN	46057	MARSHALL	46091	TURNER	46125
CLARK	46025	HAND	46059	MEADE	46093	UNION	46127

**SOUTH DAKOTA (Continued)**

CLAY	46027	HANSON	46061	MELLETTTE	46095	WALWORTH	46129
CODINGTON	46029	HARDING	46063	MINER	46097	YANKTON	46135
CORSON	46031	HUGHES	46065	MINNEHAHA	46099	ZIEBACH	46137
CUSTER	46033	HUTCHINSON	46067	MOODY	46101		

**TENNESSEE**

ANDERSON	47001	FENTRESS	47049	LAUDERDALE	47097	ROANE	47145
BEDFORD	47003	FRANKLIN	47051	LAWRENCE	47099	ROBERTSON	47147
BENTON	47005	GIBSON	47053	LEWIS	47101	RUTHERFORD	47149
BLEDSE	47007	GILES	47055	LINCOLN	47103	SCOTT	47151
BLOUNT	47009	GRAINGER	47057	LOUDON	47105	SEQUATCHIE	47153
BRADLEY	47011	GREENE	47059	MCMINN	47107	SEVIER	47155
CAMPBELL	47013	GRUNDY	47061	MCNAIRY	47109	SHELBY	47157
CANNON	47015	HAMBLEN	47063	MACON	47111	SMITH	47159
CARROLL	47017	HAMILTON	47065	MADISON	47113	STEWART	47161
CARTER	47019	HANCOCK	47067	MARION	47115	SULLIVAN	47163
CHEATHAM	47021	HARDEMAN	47069	MARSHALL	47117	SUMNER	47165
CHESTER	47023	HARDIN	47071	MAURY	47119	TIPTON	47167
CLAIBORNE	47025	HAWKINS	47073	MEIGS	47121	TROUSDALE	47169
CLAY	47027	HAYWOOD	47075	MONROE	47123	UNICOI	47171
COCKE	47029	HENDERSON	47077	MONTGOMERY	47125	UNION	47173
COFFEE	47031	HENRY	47079	MOORE	47127	VAN BUREN	47175
CROCKETT	47033	HICKMAN	47081	MORGAN	47129	WARREN	47177
CUMBERLAND	47035	HOUSTON	47083	OBION	47131	WASHINGTON	47179
DAVIDSON	47037	HUMPHREYS	47085	OVERTON	47133	WAYNE	47181
DECATUR	47039	JACKSON	47087	PERRY	47135	WEAKLEY	47183
DE KALB	47041	JEFFERSON	47089	PICKETT	47137	WHITE	47185
DICKSON	47043	JOHNSON	47091	POLK	47139	WILLIAMSON	47187
DYER	47045	KNOX	47093	PUTNAM	47141	WILSON	47189
FAYETTE	47047	LAKE	47095	RHEA	47143		

**TEXAS**

ANDERSON	48001	BANDERA	48019	BOWE	48037	CALDWELL	48055
ANDREWS	48003	BASTROP	48021	BRAZORIA	48039	CALHOUN	48057
ANGELINA	48005	BAYLOR	48023	BRAZOS	48041	CALLAHAN	48059
ARANSAS	48007	BEE	48025	BREWSTER	48043	CAMERON	48061
ARCHER	48009	BELL	48027	BRISCOE	48045	CAMP	48063
ARMSTRONG	48011	BEXAR	48029	BROOKS	48047	CARSON	48065
ATASCOSA	48013	BLANCO	48031	BROWN	48049	CASS	48067
AUSTIN	48015	BORDEN	48033	BURLESON	48051	CASTRO	48069
BAILEY	48017	BOSQUE	48035	BURNET	48053	CHAMBERS	48071
CHEROKEE	48073	GRAY	48179	LAVACA	48285	REFUGIO	48391
CHILDRESS	48075	GRAYSON	48181	LEE	48287	ROBERTS	48393
CLAY	48077	GREGG	48183	LEON	48289	ROBERTSON	48395
COCHRAN	48079	GRIMES	48185	LIBERTY	48291	ROCKWALL	48397
COKE	48081	GUADALUPE	48187	LIMESTONE	48293	RUNNELS	48399
COLEMAN	48083	HALE	48189	LIPSCOMB	48295	RUSK	48401
COLLIN	48085	HALL	48191	LIVE OAK	48297	SABINE	48403
COLLINGSWORTH	48087	HAMILTON	48193	LLANO	48299	SAN AUGUSTINE	48405
COLORADO	48089	HANSFORD	48195	LOVING	48301	SAN JACINTO	48407
COMAL	48091	HARDEMAN	48197	LUBBOCK	48303	SAN PATRICIO	48409
COMANCHE	48093	HARDIN	48199	LYNN	48305	SAN SABA	48411
CONCHO	48095	HARRIS	48201	MCCULLOCH	48307	SCHLEICHER	48413
COOKE	48097	HARRISON	48203	MCLENNAN	48309	SCURRY	48415
CORYELL	48099	HARTLEY	48205	MCMULLEN	48311	SHACKELFORD	48417
COTTLE	48101	HASKELL	48207	MADISON	48313	SHELBY	48419

TEXAS (Continued)							
CRANE	48103	HAYS	48209	MARION	48315	SHERMAN	48421
CROCKETT	48105	HEMPHILL	48211	MARTIN	48317	SMITH	48423
CROSBY	48107	HENDERSON	48213	MASON	48319	SOMERVELL	48425
CULBERSON	48109	HIDALGO	48215	MATAGORDA	48321	STARR	48427
DALLAM	48111	HILL	48217	MAVERICK	48323	STEPHENS	48429
DALLAS	48113	HOCKLEY	48219	MEDINA	48325	STERLING	48431
DAWSON	48115	HOOD	48221	MENARD	48327	STONEWALL	48433
DEAF SMITH	48117	HOPKINS	48223	MIDLAND	48329	SUTTON	48435
DELTA	48119	HOUSTON	48225	MILAM	48331	SWISHER	48437
DENTON	48121	HOWARD	48227	MILLS	48333	TARRANT	48439
DE WITT	48123	HUDSPETH	48229	MITCHELL	48335	TAYLOR	48441
DICKENS	48125	HUNT	48231	MONTAGUE	48337	TERRELL	48443
DIMMIT	48127	HUTCHINSON	48233	MONTGOMERY	48339	TERRY	48445
DONLEY	48129	IRION	48235	MOORE	48341	THROCKMORTON	48447
DUVAL	48131	JACK	48237	MORRIS	48343	TITUS	48449
EASTLAND	48133	JACKSON	48239	MOTLEY	48345	TOM GREEN	48451
ECTOR	48135	JASPER	48241	NACOGDOCHES	48347	TRAVIS	48453
EDWARDS	48137	JEFF DAVIS	48243	NAVARRO	48349	TRINITY	48455
ELLIS	48139	JEFFERSON	48245	NEWTON	48351	TYLER	48457
EL PASO	48141	JIM HOGG	48247	NOLAN	48353	UPSHUR	48459
ERATH	48143	JIM WELLS	48249	NUECES	48355	UPTON	48461
FALLS	48145	JOHNSON	48251	OCHILTREE	48357	UVALDE	48463
FANNIN	48147	JONES	48253	OLDHAM	48359	VAL VERDE	48465
FAYETTE	48149	KARNES	48255	ORANGE	48361	VAN ZANDT	48467
FISHER	48151	KAUFMAN	48257	PALO PINTO	48363	VICTORIA	48469
FLOYD	48153	KENDALL	48259	PANOLA	48365	WALKER	48471
FOARD	48155	KENEDY	48261	PARKER	48367	WALLER	48473
FORT BEND	48157	KENT	48263	PARMER	48369	WARD	48475
FRANKLIN	48159	KERR	48265	PECOS	48371	WASHINGTON	48477
FREESTONE	48161	KIMBLE	48267	POLK	48373	WEBB	48479
FRIO	48163	KING	48269	POTTER	48375	WHARTON	48481
GAINES	48165	KINNEY	48271	PRESIDIO	48377	WHEELER	48483
GALVESTON	48167	KLEBERG	48273	RAINS	48379	WICHITA	48485
GARZA	48169	KNOX	48275	RANDALL	48381	WILBARGER	48487
GILLESPE	48171	LAMAR	48277	REAGAN	48383	WILLACY	48489
GLASSCOCK	48173	LAMB	48279	REAL	48385	WILLIAMSON	48491
GOLIAD	48175	LAMPASAS	48281	RED RIVER	48387	WILSON	48493
GONZALES	48177	LA SALLE	48283	REEVES	48389	WINKLER	48495
WISE	48497	YOAKUM	48501	ZAPATA	48505		
WOOD	48499	YOUNG	48503	ZAVALA	48507		

UTAH							
BEAVER	49001	GARFIELD	49017	RICH	49033	UTAH	49049
BOX ELDER	49003	GRAND	49019	SALT LAKE	49035	WASATCH	49051
CACHE	49005	IRON	49021	SAN JUAN	49037	WASHINGTON	49053
CARBON	49007	JUAB	49023	SANPETE	49039	WAYNE	49055
DAGGETT	49009	KANE	49025	SEVER	49041	WEBER	49057
DAVIS	49011	MILLARD	49027	SUMMIT	49043		
DUCHESNE	49013	MORGAN	49029	TOOELE	49045		
EMERY	49015	PIUTE	49031	UINTAH	49047		

VERMONT							
ADDISON	50001	ESSEX	50009	LAMOILLE	50015	WASHINGTON	50023
BENNINGTON	50003	FRANKLIN	50011	ORANGE	50017	WINDHAM	50025
CALEDONIA	50005	GRAND ISLE	50013	ORLEANS	50019	WINDSOR	50027
CHITTENDEN	50007			RUTLAND	50021		

**VIRGINIA**

ACCOMACK	51001	FAUQUIER	51061	MIDDLESEX	51119	SUSSEX	51183
ALBEMARLE	51003	FLOYD	51063	MONTGOMERY	51121	TAZEWELL	51185
ALLEGHANY	51005	FLUVANNA	51065	NELSON	51125	WARREN	51187
AMELIA	51007	FRANKLIN	51067	NEW KENT	51127	WASHINGTON	51191
AMEERST	51009	FREDERICK	51069	NORTHAMPTON	51131	WESTMORELAND	51193
APPOMATTOX	51011	GILES	51071	NORTHUMBERLAND	51133	WISE	51195
ARLINGTON	51013	GLOUCESTER	51073	NOTTOWAY	51135	WYTHE	51197
AUGUSTA	51015	GOOCHLAND	51075	ORANGE	51137	YORK	51199
BATH	51017	GRAYSON	51077	PAGE	51139	ALEXANDRIA CITY	51510
BEDFORD	51019	GREENE	51079	PATRICK	51141	BEDFORD CITY	51515
BLAND	51021	GREENSVILLE	51081	PITTSYLVANIA	51143	BRISTOL CITY	51520
BOTETOURT	51023	HALIFAX	51083	POWHATAN	51145	BUENA VISTA CITY	51530
BRUNSWICK	51025	HANOVER	51085	PRINCE EDWARD	51147	CHARLOTTESVILLE CITY	51540
BUCHANAN	51027	HENRICO	51087	PRINCE GEORGE	51149	CHESAPEAKE CITY	51550
BUCKINGHAM	51029	HENRY	51089	PRINCE WILLIAM	51153	CLIFTON FORGE CITY	51560
CAMPBELL	51031	HIGHLAND	51091	PULASKI	51155	COLONIAL HEIGHTS CITY	51570
CAROLINE	51033	ISLE OF WIGHT	51093	RAPPAHANNOCK	51157	COVINGTON CITY	51580
CARROLL	51035	JAMES CITY	51095	RICHMOND	51159	DANVILLE CITY	51590
CHARLES CITY	51036	KING AND QUEEN	51097	ROANOKE	51161	EMPORIA CITY	51595
CHARLOTTE	51037	KING GEORGE	51099	ROCKBRIDGE	51163	FAIRFAX CITY	51600
CHESTERFIELD	51041	KING WILLIAM	51101	ROCKINGHAM	51165	FALLS CHURCH CITY	51610
CLARKE	51043	LANCASTER	51103	RUSSELL	51167	FRANKLIN CITY	51620
CRAIG	51045	LEE	51105	SCOTT	51169	FREDERICKSBURG CITY	51630
CULPEPER	51047	LOUDOUN	51107	SHENANDOAH	51171	GALAX CITY	51640
CUMBERLAND	51049	LOUISA	51109	SMYTH	51173	HAMPTON CITY	51650
DICKENSON	51051	LUNENBURG	51111	SOUTHAMPTON	51175	HARRISONBURG CITY	51660
DINWIDDE	51053	MADISON	51113	SPOTSYLVANIA	51177	HOPEWELL CITY	51670
ESSEX	51057	MATLEWS	51115	STAFFORD	51179	LEXINGTON CITY	51678
FAIRFAX	51059	MECKLENBURG	51117	SURRY	51181	LYNCHBURG CITY	51680
MANASSAS CITY	51683	POQUOSON CITY	51735	RICHMOND CITY	51760	SUFFOLK CITY	51800
NEWPORT NEWS CITY	51700	PORTSMOUTH CITY	51740	ROANOKE CITY	51770	VIRGINIA BEACH CITY	51810
NORFOLK CITY	51710	RADFORD CITY	51750	SALEM CITY	51775	WAYNESBORO CITY	51820
NORTON CITY	51720	MANASSAS PARK CITY	51685	SOUTH BOSTON CITY	51780	WILLIAMSBURG CITY	51830
PETERSBURG CITY	51730	MARTINSVILLE CITY	51690	STAUNTON CITY	51790	WINCHESTER CITY	51840

**WASHINGTON**

ADAMS	53001	FRANKLIN	53021	LEWIS	53041	SNOHOMISH	53061
ASOTIN	53003	GARFIELD	53023	LINCOLN	53043	SPOKANE	53063
BENTON	53005	GRANT	53025	MASON	53045	STEVENS	53065
CHELAN	53007	GRAYS HARBOR	53027	OKANOGAN	53047	THURSTON	53067
CLALLAM	53009	ISLAND	53029	PACIFIC	53049	WAHIAKUM	53069
CLARK	53011	JEFFERSON	53031	PEND OREILLE	53051	WALLA WALLA	53071
COLUMBIA	53013	KING	53033	PIERCE	53053	WHATCOM	53073
COWLITZ	53015	KITSAP	53035	SAN JUAN	53055	WHITMAN	53075
DOUGLAS	53017	KITITAS	53037	SKAGIT	53057	YAKIMA	53077
FERRY	53019	KLICKITAT	53039	SKAMANIA	53059		

**WEST VIRGINIA**

BARBOUR	54001	HANCOCK	54029	MINERAL	54057	RITCHE	54085
BERKELEY	54003	HARDY	54031	MINGO	54059	ROANE	54087
BOONE	54005	HARRISON	54033	MONONGALIA	54061	SUMMERS	54089
BRAXTON	54007	JACKSON	54035	MONROE	54063	TAYLOR	54091

**WEST VIRGINIA (Continued)**

BROOKE	54009	JEFFERSON	54037	MORGAN	54065	TUCKER	54093
CABELL	54011	KANAWHA	54039	NICHOLAS	54067	TYLER	54095
CALHOUN	54013	LEWIS	54041	OHIO	54069	UPSHUR	54097
CLAY	54015	LINCOLN	54043	PENDLETON	54071	WAYNE	54099
DODDRIDGE	54017	LOGAN	54045	PLEASANTS	54073	WEBSTER	54101
FAYETTE	54019	MCDOWELL	54047	POCAHONTAS	54075	WETZEL	54103
GILMER	54021	MARION	54049	PRESTON	54077	WIRT	54105
GRANT	54023	MARSHALL	54051	PUTNAM	54079	WOOD	54107
GREENBRIER	54025	MASON	54053	RALEIGH	54081	WYOMING	54109
HAMPSHIRE	54027	MERCER	54055	RANDOLPH	54083		

**WISCONSIN**

ADAMS	55001	FLORENCE	55037	MARATHON	55073	RUSK	55107
ASHLAND	55003	FOND DU LAC	55039	MARINETTE	55075	SAINT CROIX	55109
BARRON	55005	FOREST	55041	MARQUETTE	55077	SAUK	55111
BAYFELD	55007	GRANT	55043	MENOMINEE	55078	SAWYER	55113
BROWN	55009	GREEN	55045	MILWAUKEE	55079	SHAWANO	55115
BUFFALO	55011	GREEN LAKE	55047	MONROE	55081	SHEBOYGAN	55117
BURNETT	55013	IOWA	55049	OCONTO	55083	TAYLOR	55119
CALUMET	55015	IRON	55051	ONEIDA	55085	TREMPEALEAU	55121
CHIPPEWA	55017	JACKSON	55053	OUTAGAMIE	55087	VERNON	55123
CLARK	55019	JEFFERSON	55055	OZAUKEE	55089	VILAS	55125
COLUMBIA	55021	JUNEAU	55057	PEPIN	55091	WALWORTH	55127
CRAWFORD	55023	KENOSHA	55059	PIERCE	55093	WASHBURN	55129
DANE	55025	KEWAUNEE	55061	POLK	55095	WASHINGTON	55131
DOWE	55027	LA CROSSE	55063	PORTAGE	55097	WAUKESHA	55133
DOOR	55029	LAFAYETTE	55065	PRICE	55099	WAUPACA	55135
DOUGLAS	55031	LANGLADE	55067	RACINE	55101	WAUSHARA	55137
DUNN	55033	LINCOLN	55069	RICHLAND	55103	WINNEBAGO	55139
EAU CLAIRE	55035	MANITOWOC	55071	ROCK	55105	WOOD	55141

**WYOMING**

ALBANY	56001	FREMONT	56013	NATRONA	56025	SWEETWATER	56037
BIG HORN	56003	GOSHEN	56015	NIOBRARA	56027	TETON	56039
CAMPBELL	56005	HOT SPRINGS	56017	PARK	56029	UINTA	56041
CARBON	56007	JOHNSON	56019	PLAITE	56031	WASHAKIE	56043
CONVERSE	56009	LARAMIE	56021	SHERIDAN	56033	WESTON	56045
CROOK	56011	LINCOLN	56023	SUBLETTE	56035		

## APPENDIX C

### PART B - U. S. TERRITORIES FIPS CODES

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Territory	Page
AMERICAN SAMOA .....	C-22
FEDERATED STATES OF MICRONESIA .....	C-22
GUAM .....	C-22
MARSHALL ISLANDS .....	C-22
NORTH MARIANA ISLANDS .....	C-22
PALAU .....	C-22
PUERTO RICO.....	C-22
U.S. MINOR OUTLYING ISLANDS.....	C-22
VIRGIN ISLANDS .....	C-23



AMERICAN SAMOA 60000							
EASTERN	60010	MANUA	60020	ROSE ISLAND	60030	SWAINS ISLAND	60040
WESTERN	60050						

FEDERATED STATES OF MICRONESIA 64000							
CHUUK	64002	KOSRAE	64005	POHNPEI	64040	YAP	64060

GUAM 66000							
GUAM	66010						

MARSHALL ISLANDS 68000							
AILINGINAE	68007	ENEWETAK	68090	LIKIEP	68180	TOKE	68385
AILINGLAPLAP	68010	ERIKUB	68100	MAJURO	68190	UJAE	68390
AILUK	68030	JABAT	68110	MALOELAP	68300	UJELANG	68400
ARNO	68040	JALUIT	68120	MEJIT	68310	UTRIK	68410
AUR	68050	JEMO	68130	MILI	68320	WOTHO	68420
BIKAR	68060	KILJ	68140	NAMORIK	68330	WOTJE	68430
BIKINI	68070	KWAJALEIN	68150	NAMU	68340		
BOKAK	68073	LAE	68160	RONGELAP	68350		
EBON	68080	LIB	68170	RONGRIK	68360		

NORTHERN MARIANA ISLANDS 69000							
NORTHERN ISLAND	69085	ROTA	69100	SAIPAN	69110	TINIAN	69120

PALAU 70000							
AIMELIK	70002	KAYANGEL	70100	NGARCHELONG	70218	NGEREMLENGUI	70227
AIRAI	70004	KOROR	70150	NGARDMAU	70222	NGIWAL	70228
ANGAUR	70010	MELEKEOK	70212	NGATPANG	70224	PELELIU	70350
HATOBOHEI	70050	NGARAARD	70214	NGCHESAR	70226	SONSOROL	70370

PUERTO RICO 72000							
ADJUNTAS	72001	CIDRA	72041	LAJAS	72079	RIO GRANDE	72119
AGUADA	72003	COAMO	72043	LARES	72081	SABANA GRANDE	72121
AGUADILLA	72005	COMERIO	72045	LAS MARIAS	72083	SALINAS	72123
AGUAS BUENAS	72007	COROZAL	72047	LAS PEDRAS	72085	SAN GERMAN	72125
AIBONITO	72009	CULEBRA	72049	LOIZA	72087	SAN JUAN	72127
ANASCO	72011	DORADO	72051	LUQUILLO	72089	SAN LORENZO	72129
ARECIBO	72013	FAJARDO	72053	MANATI	72091	SAN SEBASTIAN	72131
ARROYO	72015	FLORIDA	72054	MARICAO	72093	SANTA ISABEL	72133
BARCELONETA	72017	GUANICA	72055	MAUNABO	72095	TOA ALTA	72135
BARRANQUITAS	72019	GUAYAMA	72057	MAYAGUEZ	72097	TOA BAIA	72137
BAYAMON	72021	GUAYANILLA	72059	MOCA	72099	TRUJILLO ALTO	72139
CABO ROIO	72023	GUAYNABO	72061	MOROVIS	72101	UTUADO	72141
CAGUAS	72025	GURABO	72063	NAGUABO	72103	VEGA ALTA	72143
CAMUY	72027	HATILLO	72065	NARANJITO	72105	VEGA BAJA	72145
CANOVANAS	72029	HORMIGUEROS	72067	OROCOVIS	72107	VIEQUES	72147
CAROLINA	72031	HUMACAO	72069	PATILLAS	72109	VILLALBA	72149
CATANO	72033	ISABELA	72071	PENUELAS	72111	YABUCOA	72151
CAYEY	72035	JAYUYA	72073	PONCE	72113	YAUCO	72153
CEIOA	72037	JUANA DIAZ	72075	QUEBRADILLAS	72115		
CIALES	72039	JUNCOS	72077	RINCON	72117		

U.S. MINOR OUTLYING ISLANDS 74000							
BAKER ISLAND	74050	JOHNSTON ISLAND	74200	NAVASSA ISLAND	74350		
HOWLAND ISLAND	74100	KINGMAN REEF	74250	PALMYRA ATOLL	74400		
JARVIS ISLAND	74150	MIDWAY ISLANDS	74300	WAKE ISLAND	74450		

VIRGIN ISLANDS OF THE UNITED STATES 78000							
ST. CROIX	78010	ST. JOHN	78020	ST. THOMAS	78030		

## APPENDIX D

### MENU LISTINGS

#### 10. Password Help

- 101. Access to Encoder
- 102. Access to Setup Menu
- 103. To Change Passwords
- 104. Password Lost

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- 201. To Originate Weekly Test
- 202. To Originate Monthly Test
- 203. To Originate an Alert
- 204. To Encode an Event
- 205. To Encode Locations
- 206. To Encode Event Duration
- 207. To Practice Encoding
- 208. To Send Header
- 209. To Review Transmit Message Log
- 210. To Test On-Air Relay

#### 30. Decoder Operation Help

- 301. To Acknowledge a New Message
- 302. To Change Between Automatic and Manual Mode
- 303. To Manual Forward a Message
- 304. To Review Received Message Log

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- 401. To Set Output Level On-Air
- 402. To Set Output Level Off-Air
- 403. Speaker Volume Adjustment
- 404. To Print Screen

#### EAS 911 Setup Menu

- 1. Set Current Date/Time
- 2. Set Station Time Zone
- 3. Daylight Saving?
- 4. Set Station ORG Code
- 5. Set Station FIPS Code
- 6. Set Station Identification Code
- 7. Set Attention Signal Duration
- 8. Change Primary Password
- 9. Change Setup Password
- 10. Select Events to Auto Forward
- 11. Add Locations to Auto Forward
- 12. Verify or Delete Locations to Auto Forward

#### EAS 911 Operation Menu

- 1. Review Received Messages
- 2. Review Transmitted Messages
- 3. Test On-Air Relay
- 4. Test Alert Relay
- 5. Set Output Level: On-Air Relay Open
- 6. Set Output Level: On-Air Relay Closed

#### 50. Encoder Setup Help

- 501. To Set Current Date/Time
- 502. To Set Station Time Zone
- 503. Daylight Saving?
- 504. To Set Station Originator Code
- 505. To Set Station FIPS Code
- 506. To Set Station Identification Code
- 507. To Set Attention Signal Duration
- 508. To Assign, Change or Verify Encoder Event Keys
- 509. To Assign or Re-assign Encoder Location Keys
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#### 60. Decoder Setup Help

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- 603. To Verify or Delete Locations to Auto Forward

#### 70. Accessory Setup Help

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- 702. Voice Recorder Status
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- 704. Record Voice Announcement
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- 706. To Enable CPU Interface
- 707. To Install Program Interrupt Unit
- 708. To Enable Remote Control Status Modules

#### 80. Maintenance and Technical Support Help

- 801. To Replace Printer Paper
- 803. TFT Customer Service

- 13. Assign, Change or Verify Encoder Event Keys
- 14. Assign or Re-assign Encoder Location Keys
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- 16. Voice Recorder Installed?
- 17. Remote Sign Definition
- 18. Char Gen Definition
- 19. Remote Interface Definition
- 20. Set LCD Contrast
- 21. Record Voice Announcement
- 22. Verify Voice Announcement
- 23. Enable Remote Control/Status Modules
- 24. Set One-Button Weekly Test Option
- 25. Set Alert Timeout

## APPENDIX E

### EAS 911 DECODER/ENCODER TO VIDEO CHARACTER GENERATOR INTERFACE

#### 1. Introduction

This specification describes the data and audio interface between the TFT EAS 911 and a video character generator (CG). The interconnections between the EAS 911 and the CG are through the COM2 J302, AUDIO OUTPUT J101, and the ON-AIR relay J106 on the rear panel of the EAS 911. See section 5 of this Appendix for details.

#### 2. General Sequence and Comments

The protocol between the CG and EAS 911 is a hand-shaking sequence of codes for the CG and EAS 911 to communicate with each other in order to request or acknowledge header, audio, EOM or other data or audio transfer. The general sequence is for the Character Generator to request action after the EAS 911 informs the CG that a message is available. Please see the Protocol Table in Section 3 for details.

#### 3. Protocol Table

Purpose	Step	CG Data Out to EAS 911	EAS 911 Data Out to CG	EAS 911 Audio Out to CG	On-Air Relay Status	Remarks
To inform the CG that the EAS 911 has a message to transmit	1		STX + Control-4 + EAS Header + ETX			A
To request pre-recorded voice announcement	2A	STX + Control-6 + ETX				B
	2B			Recorded voice announcement	Closed	
	2C		STX + Control-6 + ETX			
To request a translation of the EAS header from the EAS 911	3A	STX = Control-3 + ETX				B
	3B		STX + Control-3 + EAS Header "Translation"+ ETX			
To request audio transmission of the EAS header and attention signal	4A	STX + Control-1 + ETX				B
	4B			EAS header & attention signal	Closed	
	4C		STX + Control-1 + ETX			
To request last alert voice message & EOM	5A	STX + Control-2 + ETX				B
	5B			Alert voice and EOM	Closed)	
	5C		STX + Control-2 + ETX			

### 3. Protocol Table (Continued)

To request the last text message from EAS 911	6A	STX + Control-5 + ETX				B	
	6B		STX + Control-5 + Text + ETX		Closed		
To request only the last voice message stored in EAS 911	7A	STX + Control-7 + ETX				B	
	7B			Alert voice	Closed		
	7C		STX + Control-7 + ETX				
To inform CG of an exception condition (abort, time-out)	8		STX + Control-8 + ETX			C	

#### 3.1 Remarks

- A. The EAS 911 will attempt to notify the CG that a message is available (Step 1A) up to 3 times with a 2 second pause between each attempt. The CG should acknowledge this notification with a request for more information about the message - for instance by requesting a translation of the EAS header, Step 3A. If the CG does not respond the EAS 911 will abort message transmission.
- B. The above protocol describes a sequence for initial message transmission. The CG may request information on the last transmitted message at a later time. However, in the interim the optional alert voice message may have been updated by an incoming non-forwardable message.
- C. During the initial message transmission protocol sequence, the EAS 911 will wait a maximum of 2 minutes for a request from the CG. If 2 minutes elapses without a request from the CG, the EAS 11 will timeout. After a timeout the EAS 911 transmit an exception code (Step 8) and abort message transmission.
- D. The EAS 911 will not interact with the CG when in Practice Mode.

#### 4.0 Mode of Operation

A suggested operation and initial message transmission protocol sequence for each kind of transmission the EAS 911 may initiate follows.

- 4.1 When the EAS 911 is operated in Auto Mode and a non-priority message is being automatically forwarded:
  - a. EAS 911 informs CG that it has a message to transmit (Step 1).
  - b. CG requests header translation (Step 3A).
  - c. The EAS 911 transmits the header translation (Step 3B).
  - d. The CG requests the audio header and attention signal (Step 4A).
  - e. The EAS 911 transmits audio (Step 4B) followed by data acknowledge (Step 4C).
  - f. CG requests alert voice message and audio EOM (Step 5A).
  - g. The EAS 911 transmits alert voice and audio EOM (Step 5B) followed by data acknowledge (Step 5C).
- 4.2 When the EAS 911 is operated in Manual Mode and the last received message is being manually forwarded by an operator:
  - a. Operator presses flashing SEND HEADER key on the EAS 911 front panel.
  - b. The EAS 911 informs the CG that it has a message to transmit (Step 1).

- c. CG requests header translation (Step 3A).
  - d. The EAS 911 transmits the header translation (Step 3B).
  - e. The CG requests the audio header and attention signal (Step 4A).
  - f. The EAS 911 transmits audio (Step 4B) followed by data acknowledge (Step 4C).
  - g. CG requests alert voice message and EOM (Step 5A).
  - h. The EAS 911 transmits the last audio alert voice message (Step 5B\*) and then flashes the SEND EOM LED on the front panel.
  - i. The operator presses SEND EOM on the EAS 911 front panel.
  - j. The EAS 911 transmits audio EOM (Step 5B\*) followed by data acknowledge (Step 5C).
- 4.3 When the EAS 911 is transmitting an encoded message:  
Steps a - g are the same as for a manually forwarded message, described in 4.2.
- h. The EAS 911 flashes the SEND EOM LED on the front panel.  
Steps i and j are the same as for a manually forwarded message, described in 4.2.
- 4.4 When the EAS 911 is auto forwarding a priority message (event code is "EAN" or "EAT"):
- a. EAS 911 informs CG that it has a message to transmit (Step 1).
  - b. The CG should IMMEDIATELY request the audio header and attention signal (Step 4A).
  - c. The EAS 911 transmits audio (Step 4B) followed by data acknowledge (Step 4C).
  - d. The CG should IMMEDIATELY request alert voice message and EOM (Step 5A).
  - e. The EAS 911 will begin audio feed-through to transmit the incoming priority alert voice message directly out the XLR audio output (Step 5B\*). The CG should monitor and broadcast this audio. When the EAS 911 receives an EOM for the priority message it will transmit the audio EOM (Step 5B\*) and then send data acknowledge (Step 5C) to the CG.

## 5. Additional Specifications

Command Structure.....	STX + Control + Optional Data + ETX
Data.....	9600 baud (8, N, 1), RS232, ASCII Control Codes
Start-of-Text (STX) .....	Hex 0x02
End-of-Text (ETX).....	Hex 0x03
Control-1.....	Hex 0x04, request/acknowledge audio header & attention signal
Control-2.....	Hex 0x05, request/acknowledge alert voice & audio EOM
Control-3.....	Hex 0x06, request/acknowledge header translation
Control-4.....	Hex 0x07, notify C.G. that EAS 911 is ready to transmit
Control-5.....	Hex 0x08, request/acknowledge text message
Control-6.....	Hex 0x09, request/acknowledge user-recorded voice announcement
Control-7.....	Hex 0x0A, request/acknowledge alert voice only
Control-8.....	Hex 0x0B, inform C.G. of exception (abort or time-out)
Data Connector .....	DB9: Pin 2=Rx, Pin 3=Tx, Pin 5=GND
Audio.....	600 ohms balanced, 0.5 - 6.0 Vp-p
Audio Connector .....	XLR: Pin 1=GND, Pin 2=POS(+), Pin 3=NEG(-)

## 6. General Notes and References

1. Refer to Emergency Alert System, FCC Rules, Part 11, or TFT EAS Primer for the specification of the EAS protocol.
2. EOM is end-of-message.
3. The attention signal is the two-tone EBS signal of 853 Hz & 960 Hz.
4. Last text message refers to the ASCII text message stored in the EAS 911.

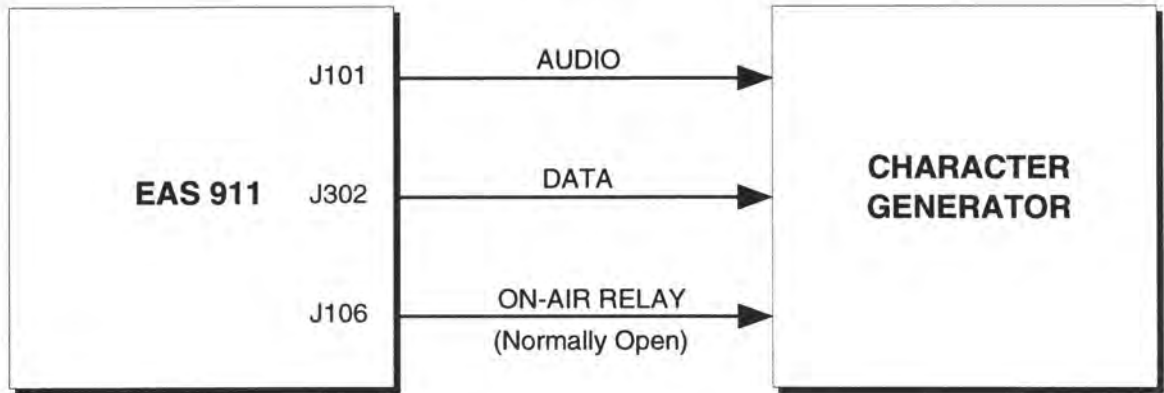


Figure C-1. System Interconnect Diagram

**APPENDIX F**  
**ORIGINATOR AND EVENT CODE TRANSLATIONS**

Originator codes:

<u>ORG</u>	<u>English Translation</u>
CIV	A CIVIL AUTHORITY
EAN	THE EMERGENCY ACTION NOTIFICATION NETWORK
EAS	A BROADCAST STATION OR CABLE SYSTEM
PEP	A PRIMARY ENTRY POINT
WXR	THE NATIONAL WEATHER SERVICE

<u>Event Code</u>	<u>English Translation</u>
EAN	A NATIONAL EMERGENCY ACTION NOTIFICATION
EAT	A NATIONAL EMERGENCY ACTION TERMINATION
NIC	A NATIONAL INFORMATION CENTER MESSAGE
NPT	A NATIONAL PERIODIC TEST
RMT	A REQUIRED MONTHLY TEST
RWT	A REQUIRED WEEKLY TEST
TOA	A TORNADO WATCH
TOR	A TORNADO WARNING
SVA	A SEVERE THUNDERSTORM WATCH
SVR	A SEVERE WEATHER WARNING
SVS	A SEVERE WEATHER STATEMENT
SPS	A SPECIAL WEATHER STATEMENT
FFA	A FLASH FLOOD WATCH
FFW	A FLASH FLOOD WARNING
FFS	A FLASH FLOOD STATEMENT
FLA	A FLOOD WATCH
FLW	A FLOOD WARNING
FLS	A FLOOD STATEMENT
WSA	A WINTER STORM WATCH
WSW	A WINTER STORM WARNING
BZW	A BLIZZARD WARNING
HWA	A HIGH WIND WATCH
HWW	A HIGH WIND WARNING
HUA	A HURRICANE WATCH
HUW	A HURRICANE WARNING
HLS	A HURRICANE STATEMENT
TSA	A TSUNAMI WATCH
TSW	A TSUNAMI WARNING
EVI	AN IMMEDIATE EVACUATION NOTICE
CEM	A CIVIL EMERGENCY MESSAGE
DMO	A PRACTICE/DEMO WARNING
ADR	AN ADMINISTRATIVE MESSAGE



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