To whom it may concern: **June 4, 2002**

TFT, Inc. is a manufacturer of EAS Encoders/Decoders, who now seeks Type Certification of an EAS Decoder (only) under FCC Rule Part 11.

On January 31, 1996, TFT, Inc. was granted Type Certification on an Emergency Alert System Encoder/Decoder, FCC Identifier BIOEAS911, File No. 31010/EQU 4-3-4. The Decoder (only) for which TFT now seeks Type Certification is part of the original Certification Application made on November 10, 1995. Several of the Part 11 Compliance Tests for that application are incorporated in this new application for an EAS Decoder (only) device, which does not function as an Encoder as well.

In order to accomplish this, TFT has removed several circuits and components from the original Encoder/Decoder in order to disable and defeat its functionality as an EAS Encoder. Because the overall construction of the unit is not materially changed, all Decoder tests conducted for the original application remains at no change and may apply to this application as well.

Best regards,

Edmund Fong
Executive Vice President- TFT Inc.

EAS 911D Decoder

Preliminary Data Sheet

Features

- Decodes and forwards EAS emergency messages
- Two self-contained receivers
- RS-232 Output for character generator interface
- Built-in impact printer
- Digital audio recorder
- Front panel mounted speaker
- LCD display
- Password protected
- Automatic or manual operation
- FCC Type Notification Pending

General

Until now a decoder-only for broadcast and cable applications of the Federal Communications Commission's (FCC) Emergency Alert System (EAS) has not existed. The EAS 911D is a decoder only, based on the proven performance of the TFT EAS 911 line of EAS Encoder/Decoders, that permits a broadcaster or cable operator to receive and forward EAS messages. These operations may be handled either automatically for unmanned situations or manually with the assistance of an operator.

The EAS 911D has many of the features of the EAS 911 Encoder/Decoders, including a built-in impact printer, character generator interfaces, a lighted numeric keypad, practice operation, and many visual indicators. The EAS 911D also features easy set-up and operation with a combination of LCD and lighted key displays that guide an operator or installer through each step.

Decoder Section

The decoder section of the EAS 911D is programmed in the same fashion as the EAS 911 encoder/decoders. Password protection allows an operator to set up all parameters associated with decoding EAS messages, including setting the current date and time, setting the station time zone, automatic observance of daylight savings time, and the station's FIPS (Federal Information Processing System) code.

The decoder can be programmed for automatic forwarding of EAS messages when user-selected criteria of event selection and location are met. The event code and location codes of an incoming EAS message are compared electronically to lists stored in setup of the EAS 911D to decide whether a message should automatically forwarded. If there is a match of both the event field and at least one of the location fields, the message will be automatically forwarded.

Also in setting up the EAS 911D several interfaces are available for video character generators. These character generators are available in both analog and digital versions. Some interfaces even permit setting of character generator parameters from the EAS 911D. The user can also select whether text for the Required Weekly Test (RWT) is sent to the character generator or not.

In Setup Mode, the EAS 911D can also record a short voice announcement (used for cable television system compliance), set the alert time-out, and enable a one-button method of manually forwarding a message.

Receiver Section

Built into the EAS 911D are two receiver modules for receiving the two FCC mandated monitoring assignments. These receivers are frequency agile for both AM and FM broadcast and can be configured in any combination if specified at time of order.

The frequency for each receiver is set with rotary DIP switches behind an access panel on the front of the unit. All standard broadcast frequencies can be digitally set.

Front Panel

The EAS 911D front panel is laid out to guide the installer or operator through all the functions necessary to program and operate the unit. In addition to the lighted numeric keypad, the front panel also has other pushbuttons for password, cancel, practice, header send, EOM send, message waiting acknowledgment, manual forwarding, mode switching, and review of both the header and audio portions of an EAS message. Indicators for receiver signal levels, an alert relay closure, an on-air relay closure, and auto/man functions clearly show status of the decoder at a single glance.

A speaker key permits audio monitoring of the two built-in receivers and the digital audio recorder. The speaker key also changes the function of the LCD to a bargraph to provide a visual indication of receiver operation.

Rear Panel

Connectors for RF inputs to the receivers, speaker/printer inhibit, balanced audio output, on-air relay, message alert relay, and digital ports are located on the rear. A professional 120 VAC/60 Hz power and fuse receptacle are also provided.

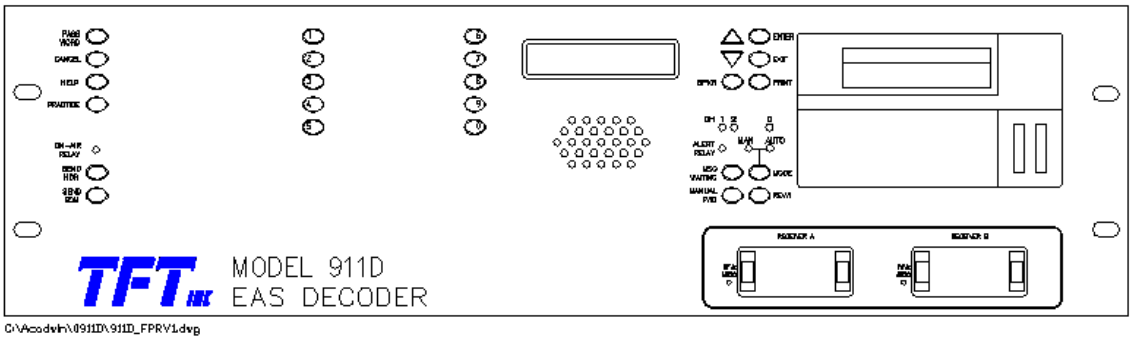
Note: This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be offered for sale or lease, or sold or leased, until authorization is obtained.

Contents subject to change without notice.

P/N 5004-EAS911D REV. A
June 2002
EQUIPMENT SERIAL NO. _____
SHIPMENT DATE _____

MODEL EAS911D
EMERGENCY ALERT SYSTEM
EAS DECODER
USER'S GUIDE

TFT, INC.
2243 RINGWOOD AVENUE,
SAN JOSE, CA 95131
TEL: (408) 943-9323
Service Department Ext. 300
FAX: (408) 432-9218



EAS 911D
EAS DECODER

The EAS DECODER is a combined Emergency Alert System (EAS) Decoder and Receivers in single unit that permits broadcasters, cablecasters and emergency managers to receive, store, forward Emergency Alert Messages prescribed by the FCC's EAS Rules. By using the EAS digital protocol, the Decoder responds only to the user pre-selected messages and forwards only certain messages automatically with no operator intervention.

FEATURES:

MODEL 911D

- Low Cost, Easy EAS Decoder with AM/FM Receiver in Single Unit
- Fully Compliant with FCC Part 11, Emergency Alert System Rules
- Fully Compliant with FCC Part 15 Rules
- Fully Compatible with NOAA Weather Radio SAME Code
- Scans 2 Required Audio Inputs
- Two RS-232 Interfaces
- Full Features for Unattended Operation.
- Front Panel Logging Printer
- Built-in Two-Minute Digital Voice Storage
- Interface for Video Character Generator
- FCC ID No. BIOEAS911D
- 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.

CONTENTS

SECTION I - GENERAL INFORMATION

SECTION II - GETTING TO KNOW YOUR EAS DECODER AND RELATED EQUIPMENT

SECTION III - PRE-INSTALLATION CHECKOUT

CONTENTS (Continued)

SECTION III - PRE-INSTALLATION CHECKOUT (Continued)

SECTION IV - PROGRAMMING THE EAS DECODER

CONTENTS (Continued)

SECTION IV - PROGRAMMING THE EAS DECODER (Continued)

SECTION V - INSTALLATION

SECTION VI - OPERATION

SECTION VII – NOT AVAILABLE FOR MODEL 911D

SECTION VIII - AM/FM RECEIVER

SECTION XI - THEORY OF OPERATION

SECTION X - MAINTENANCE AND REPAIR

APPENDICES

SECTION I
GENERAL INFORMATION

1.1 INTRODUCTION

This EAS DECODER User's Guide is arranged in TEN sections, as follows:

Section I: **General Information**
A general description of the EAS DECODER, its specifications, general information on the FCC designator, warranty and damage claim procedures, and technical support information.

Section II Getting To Know Your EAS DECODER and Related Equipment
Overview of the various system components of the EAS DECODER 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 DECODER and its related equipment. The user should find it useful to perform the tests in this section with all the EAS DECODER equipment on a lab bench.

Section IV: Programming The EAS DECODER
Detailed description of setup procedures of various EAS DECODER system parameters, e.g. system date and time, station FIPS codes, Auto Forward events and locations selection.

Section V: Installation
Instruction for installing and adjusting various system components of the EAS DECODER.

Section VI: Operation
Describes operational details of the system, including procedures to decode an EAS message.

Section VI: Not Used
This section has been intentionally deleted.

Section VIII: AM/FM Receiver
Detailed description of the AM/FM receiver modules parameters, e.g. specifications, block diagrams, front and rear panels control and indicators, as well as antenna installations.

Section XI: Theory of operation
A general description of the EAS Information Super Highway network, overview of the EAS DECODER and brief Circuit description of each module.

Section X: Maintenance and Repair
Describes routine maintenance procedures and tools and equipment requirements.

1.2 EQUIPMENT DESCRIPTION

The EAS DECODER is a combined Emergency Alert System (EAS) Decoder and Receivers that enables broadcasters and cablecasters to receive, store, forward Emergency Alert Messages as required by the FCC's EAS Rules. By using the EAS digital protocol prescribed by the FCC, the EAS DECODER 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.

Although the EAS 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 two levels of security, relieve the operator of needing to make crucial decisions at critical times. Emergency messages can then travel quickly and efficiently through the Emergency Alert System.

The EAS DECODER 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 DECODER can perform all the critical emergency alert functions in automatic mode with the voice recorder 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 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 DECODER voice recorder 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 digital voice message recorder allows automatic forwarding.

Two audio inputs and one RS-232 data input are standard on the EAS DECODER to connect to receivers for the two required monitoring assignments of the new EAS. A single audio output connects to external audio switching and distribution systems or to a TFT transmitter/program interrupt unit. This 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 DECODER contains all the header, Attention Signal and EOM codes in proper EAS format for emergency alerting.

1.3 SPECIFICATIONS

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

Table 1.3-1. EAS DECODER Specifications

Front Panel

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 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

LOCATION(S) Keys …… 14 key for user-assigned locations

ON-AIR RELAY LED ……. Indicates that the On-Air relay is closed

REVIEW Key .....…….. Allows review of last message received

LED Indicators …… Three yellow LEDs to indicate incoming EAS channel, two analog and one digital.

Two yellow LEDs to indicate AUTO or MANNUAL mode of operation and one red LED to show status of the Alert relay

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

& DOWN Keys ……..…….. Assist initial setup and programming of the equipment

REAR PANEL

Audio Inputs …….Two audio inputs from receivers. Balanced or unbalanced, 10 k-ohms, 0.35 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

Printer/Speaker Inhibit .....Connects to external switch or relay contacts. Normal operation on contact open. Printing and Speaker operation inhibited (muted) on contact closure COM2.....……..COM Port Expander

MECHANICAL AND ENVIRONMENTAL

Input Power.....…117 VAC ±10%, 60Hz, 50 watts maximum.

Operating Temperature ……0 °C to 50 °C

Size .....5.25" H x19" W x10" D

Net Weight.....Approximately 14 lbs

Shipping Weight .....Approximately 16 lbs.

1.4 FCC DESIGNATOR

The EAS DECODER Emergency Alert System Decoder is Type-Certified under FCC Part 15, and Type-Certified under Part 11. The FCC designator is BIOEAS911D.

1.5 WARRANTY INFORMATION

The following warranty policy and limitations are applicable to the Model 911D EAS DECODER.

TFT, Inc. warrants each manufactured Model 911D EAS 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 Model 911D EAS DECODER 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 Model 911D EAS 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.
2243 Ringwood Avenue
San Jose, CA 95131
Tel: (408) 943-9323 Ext. 300 Fax: (408) 432-9218

SECTION II

GETTING TO KNOW YOUR EAS DECODER AND RELATED EQUIPMENT

2.1 INTRODUCTION

This section provides an overview description of the EAS DECODER 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
Model 911D User's Guide	5004-911D	1
Power Cord	1950-7742	1
Warranty Notice	3002-0002	1
2-PIN Female Terminal Block Connector	1700-1203	4
3-PIN Female Terminal Block Connector	1700-1205	2
6-PIN Female Terminal Block Connector	1700-5007	1
AM Loop Antenna	2140-7215	1
Rack Mount Screws	2110-0013	4
Rack Mount Washers	2115-0001	4

2.3 THE FRONT PANEL

The EAS DECODER 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 Left Section

The left section includes all the command keys as well as the 10 numeric keys. Detailed description on the usage and operation of the keys can be found in this Section.

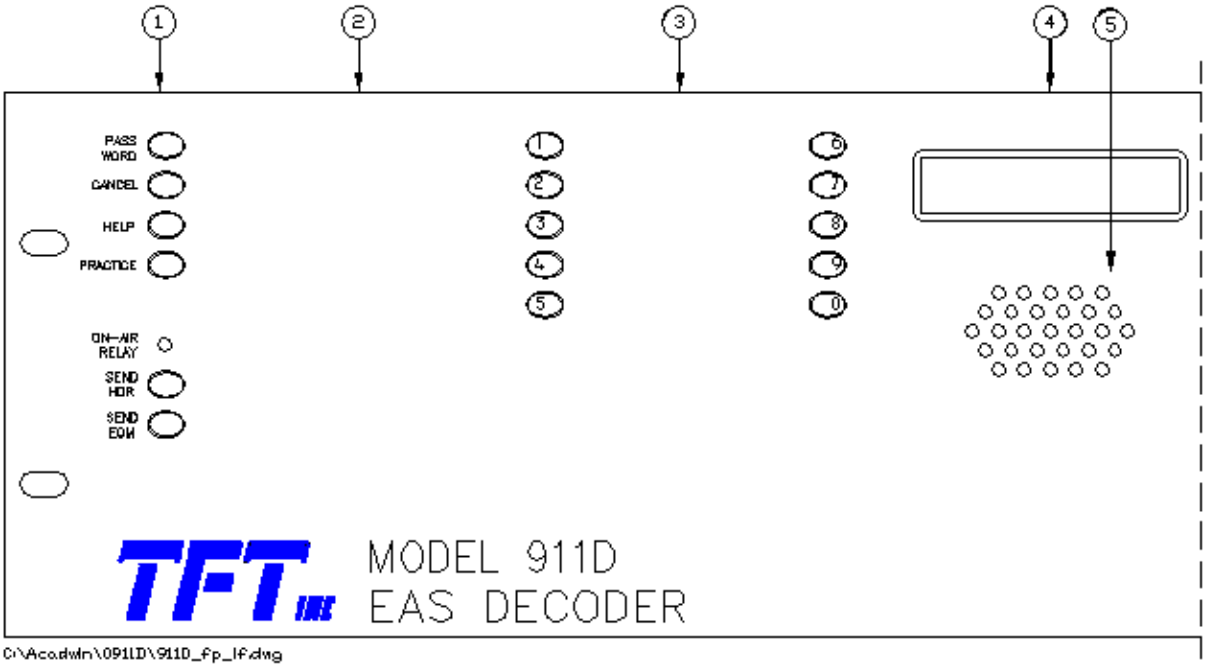


Figure 2.3-1. Decoder Front Panel Left Section Controls and Indicators

Table 2.3-1. Decoder Front Panel Left Section Controls and Indicators

ITEM	TITLE	FUNCTION
		Note: All EAS DECODER 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.
1	LEFT SECTION	A group of keys and indicators used for control of left section of the EAS DECODER.
	PASSWORD	Key. Used to access the Operational Mode and the Setup Menu.
	CANCEL THIS THIS THIS THIS	Key. May be used to clear inputs or return to a previous entry mode. During manually forwarded messages, pressing CANCEL deactivates the ON-AIR relay and aborts message transmission.
	HELP	Key. Provides access to help menus in Ready, Operation and Setup modes.
	PRACTICE	Key. Prevents the ON-AIR relay from being activated so that message decoding operations may be practiced without on-air program interruption.
	ON-AIR RELAY	LED Indicator. illuminated whenever the ON-AIR relay is activated.
	SEND HDR (Send Header)	Key. When flashing, activates the ON-AIR relay and sends the programmed or repeated EAS header information.
	SEND EOM	Key. When flashing, SEND EOM activates the ON-AIR relay and sends the EAS End Of Message code.
2	Not used	
3	1 to 0 Numeric Keys	Used for setup, programming and entering passwords
4	LCD Screen	16-character by 1-line LCD display screen. Displays date, time, header, setup, and help information.
5	Speaker	Speaker. Outputs the inputs and Header, Message, and End of Message (EOM) audio and CH1, CH2 Receivers output

2.3.2 Right Section

The right section of the front panel includes 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.

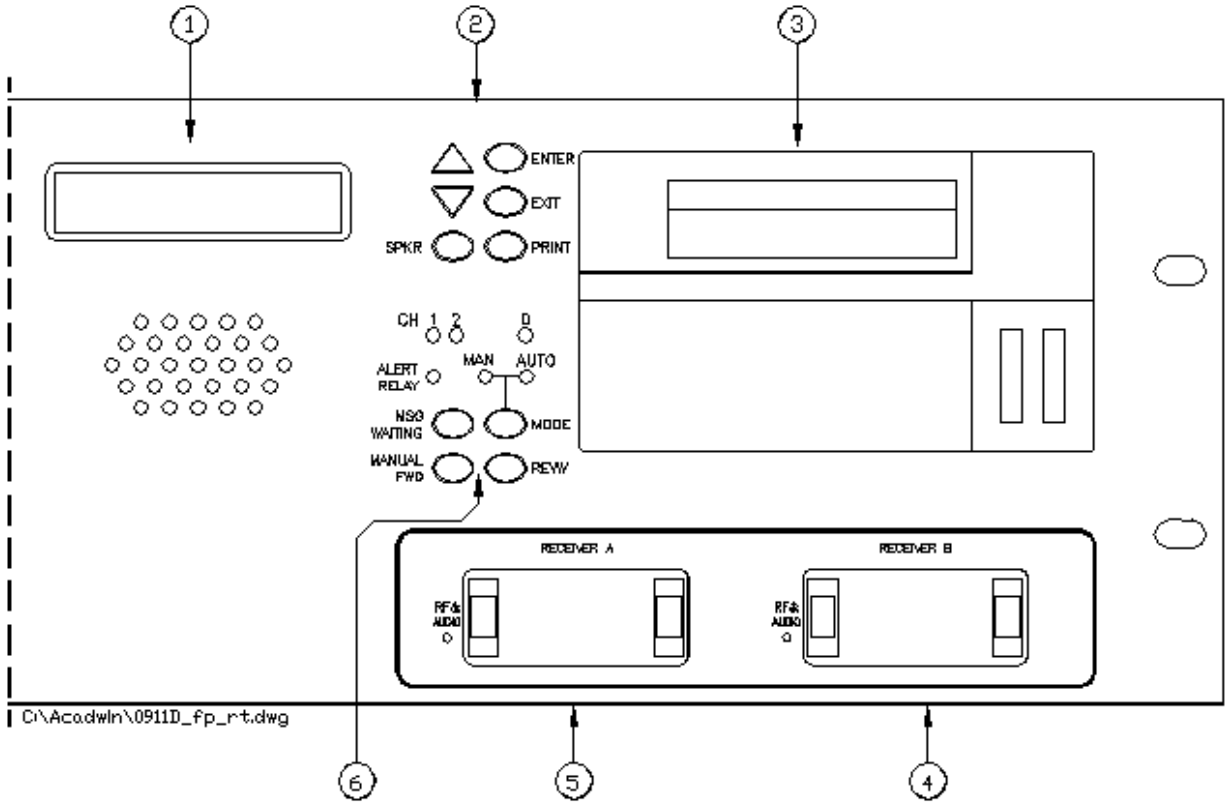
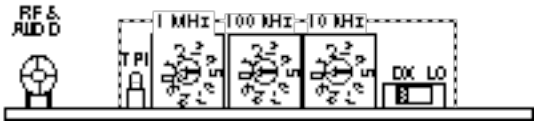
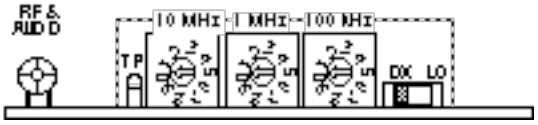


Figure 2.3-2. Decoder Controls and Indicators

Table 2.3-2. Decoder Controls and Indicators

ITEM	TITLE	FUNCTION
1	LCD	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		A group of six keys with functions as marked
	ENTER	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.
		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	Printer	Optional 24-column printer. Produces hard copy of EAS messages and Program and Help menus.

4	AM RECEIVER	Receiver module for AM broadcast band (540 - 1720 kHz)
		
		Figure 2-2. AM Receiver Module Edge-Mounted Controls and Indicators
	RF & AUDIO	Yellow LED. Flashes when an RF signal is detected which is above the minimum level of 20 µV and has audio modulation.
	TP1	Test point for RF Signal Strength Indication (RSSI) monitoring
	1 MHz, 100 kHz, 10 kHz	Rotary switches for setting receive frequency
	DX/LO	Local/Distant switch for setting receiver sensitivity
5	FM RECEIVER	Receiver module for FM broadcast band (88 - 108 MHz)
		
		Figure 2-3. FM Receiver Module Edge-Mounted Controls and Indicators
	RF & AUDIO	Yellow LED. Flashes when an RF signal is detected which is above the minimum level of 10 µV and has audio modulation.
	TP1	Test point for RF Signal Strength Indication (RSSI) monitoring
	1 MHz, 100 kHz, 10 kHz	Rotary switches for setting received frequency
	DX/LO	Local/Distant switch for setting receiver sensitivity
6		A group of four keys and six LEDs which function as marked:
	MSG WAITING	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.
	MODE	Key. Each time key is pressed, the EAS DECODER 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.

2.4 THE REAR PANEL

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

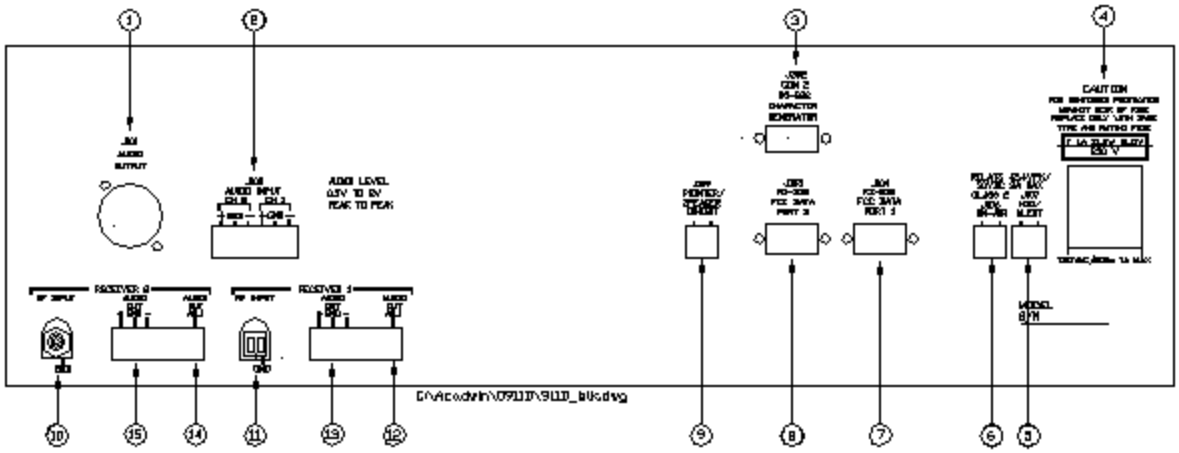


Figure 2.3-3. Rear Panel Connectors

Table 2.3-3. Rear Panel Connectors

ITEM	TITLE	FUNCTION
1	J101 AUDIO OUTPUT	XLR connector. Provides balanced audio output for transmission of EAS messages.
2	J102 CH 1, 2 AUDIO INPUT	6-pin connector on the Audio Input. Provides two balanced inputs for audio from EAS sources.
3	COM 2 RS-232	9-pin D-connector on the COM Port Expander Board. Provides an RS-232 port for use as a character generator interface.
4	120VAC/60 Hz FUSE: 2A	Recessed IEC connector with built-in fuse holder for a standard U.S. 120 VAC, 60 Hz line cord.
5	J107 MSG/ALERT RELAY	2-wire relay contact. Relay is normally open. Relay contacts close when a valid EAS message header is decoded.
6	ON-AIR RELAY	2-wire relay contact. Relay is normally open. Relay contacts close when an EAS message is transmitted.
7	J104 RS-232	9-pin D-connector. Provides a bi-directional RS-232 port for data output at 1200 baud.
8	J103 RS-232	9-pin D-connector. Provides a bi-directional RS-232 port for data input at 1200 baud.
9	J109 PRINTER/SPEAKER INHIBIT	2-pin connector. Provided to inhibit the printer and mute the speaker.
10	RF INPUT RECEIVER 2	Type “F” connector for RF input to FM receiver
11	RF INPUT RECEIVER 1	2-pin connector for RF input to AM receiver
12	AUDIO OUT ADJ RECEIVER 1	Audio output level adjustment pot for Receiver 1
13	AUDIO OUT RECEIVER 1	Audio output connector for Receiver 1
14	AUDIO OUT ADJ RECEIVER 2	Audio output level adjustment pot for Receiver 2
15	AUDIO OUT RECEIVER 2	Audio output connector for Receiver 2

2.5 Printer

A 24-column printer is provided to record EAS messages received and transmitted. In addition, it is useful for printing HELP menus.

2.6 RELATED EQUIPMENT

The EAS DECODER 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 930A 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 DECODER audio inputs. This allows a user to plug up to four different receivers into the chassis, then connect them to the EAS DECODER. There is one output per receiver. A separate data sheet is available for the TFT EAS 930 receiver.

2.6.2 TFT EAS 940A 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 J4 on the EAS DECODER rear panel. The EAS 940 can be located up to 2,000 feet from the EAS DECODER.

2.7 PRE-INSTALLATION INFORMATION

Before installing your TFT EAS DECODER, 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 DECODER 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 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 DECODER will greatly reduce the time required to program the 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 Not applicable

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 Not applicable

2.8.10 Events to Auto Forward:

_____ _____
(Event) (Event)

_____ _____
(Event) (Event)

_____ _____
(Event) (Event)

2.8.11 Not applicable

2.8.12 Locations to Auto Forward:

_____ _____
(Name) (FIPS)

_____ _____
(Name) (FIPS)

_____ _____
(Name) (FIPS)

_____ _____
(Your State) (0SS000)

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 DECODER 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 DECODER, 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 DECODER will be in the Ready Mode, monitoring the audio inputs for incoming EAS messages.

3.3 Not Available

3.4 TEST WITH ANCILLARY EQUIPMENT

3.4.1 Test with EAS Decoder Receiver Module

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

At this time it may be convenient to set the audio input levels to the EAS DECODER Receiver. 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 940A Program/Transmitter Interrupt Unit

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

3.5 TESTING THE PRINTER

The printer can be tested by pressing the PRINT key on the EAS DECODER front panel. The 24-column printer will print out the text displayed on the LCD.

3.6 TESTING THE DIGITAL VOICE RECORDER

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.

3.7 TESTING WITH A VIDEO CHARACTER GENERATOR

Refer to the Character Generator operation manual.

SECTION IV

PROGRAMMING THE EAS DECODER

4.1 INTRODUCTION

The EAS DECODER can be programmed to customize its configuration and to automate its operation. EAS DECODER 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.

THIS THIS THIS THIS **THIS** **THIS THIS THI**

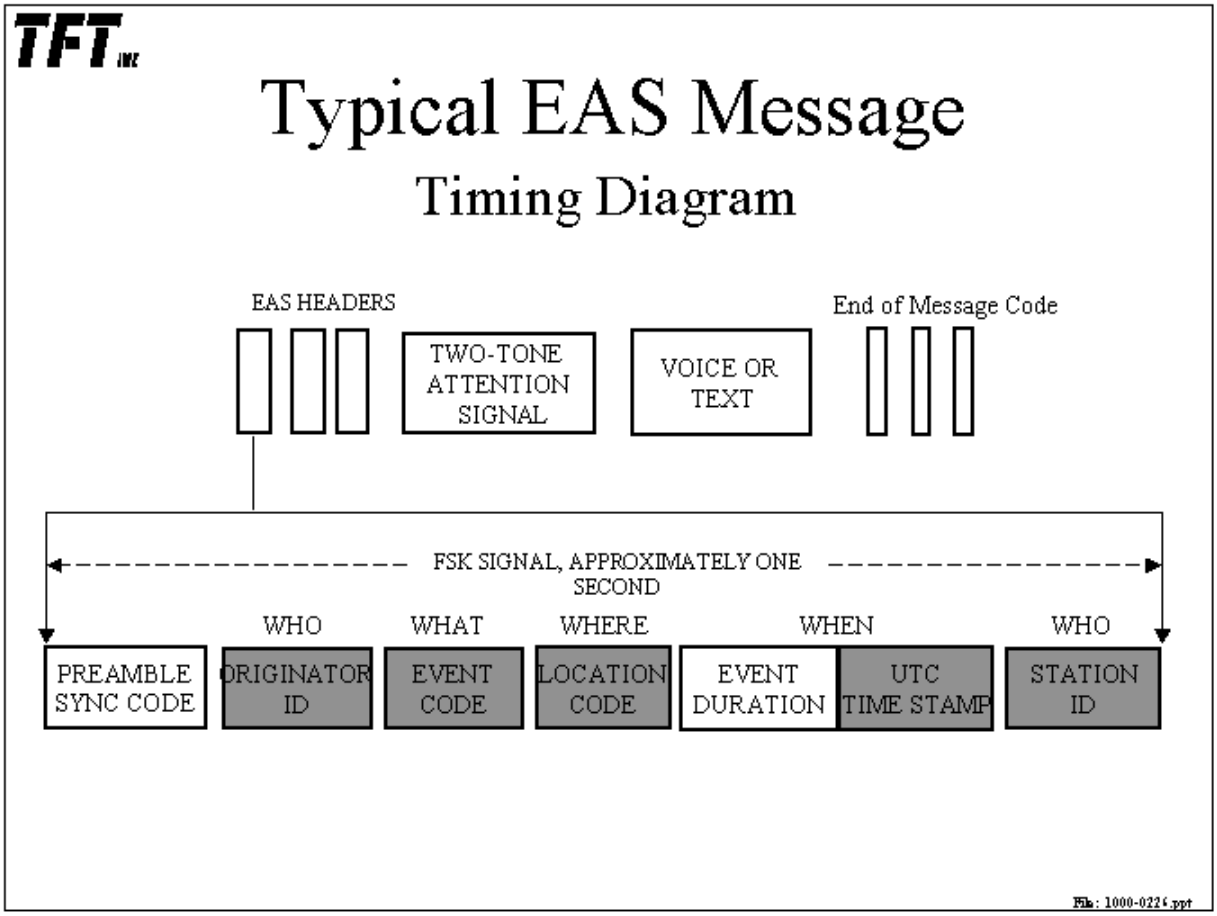


Figure 4.2-1 EAS Message Timing Diagram

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 DECODER 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 (Δ ∇) 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 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.

Table 4.3-1. Setup Menu Items

Menu Item	Refer to Manual Section
1. SET CURRENT DATE/TIME	4.4
2. SET STATION TIME ZONE	4.3
3. DAYLIGHT SAVING?	4.5
4. NOT AVAILABLE	4.6
5. SET STATION FIPS CODE	4.7
6. SET STATION IDENTIFICATION CODE	4.8
7. NOT AVAILABLE	4.9
8. CHANGE PRIMARY PASSWORD	4.10
9. CHANGE SETUP PASSWORD	4.11
10. SELECT EVENTS TO AUTO FORWARD	4.13
11. ADD LOCATIONS TO AUTO FORWARD	4.14
12. VERIFY OR DELETE LOCATIONS TO AUTO FORWARD	4.15
13. NOT AVAILABLE	4.15
14. NOT AVAILABLE	4.16
15. NOT AVAILABLE	4.17
16. VOICE RECORDER INSTALLED?	4.18
17. NOT AVAILABLE	4.19
18. ENABLE CHAR GEN INTERFACE	4.20
19. NOT AVAILABLE	4.21
20. SET LCD CONTRAST	4.22
21. RECORD VOICE ANNOUNCEMENT	4.23
22. VERIFY VOICE ANNOUNCEMENT	4.24
23. NOT AVAILABLE	4.25
24. NOT AVAILABLE	4.26
25. SET ALERT TIMEOUT	4.27
26. SET ONE-BUTTON MANUAL FORWARD	4.28
27. ENABLE CG TEXT FOR RWT	4.29
28. SET AUTO MODE TIMER	4.30
29. NOT AVAILABLE	4.31
30. NOT AVAILABLE	4.32
31. NOT AVAILABLE	4.32
32. NOT AVAILABLE	4.32

UTC offsets for the U.S. are listed in Table 4.3-2.

Table 4.3-2. 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.

4.4 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 (Δ ∇) 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.

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 DECODER 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 Δ or ∇ 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 NOT AVAILABLE

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.

For the Cable Version of the EAS 911:

Press the SUBDIVISION key.

ZONE: ♥ *code* appears on the LCD, when code is ALL or 1 to 16.

Use the arrow keys (Δ ∇) to scroll through the list of 16 zones.

Select a zone for encoding by pressing the ENTER key. The presence of the ♥ indicates that the zone is selected. Pressing the ENTER key will toggle the diamond (♥) to change the status of each zone.

Press EXIT to confirm and end.

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 NOT AVAILABLE

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 CONFIRM. **(Do This SLOWLY)**

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 (See Appendix F for Listing)

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 (See Appendix C for Listing)

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.

Model 911 (Cable versions of the EAS 911) have the capability of addressing additional zones through an RF modulator when used with the TFT cable in-home alerting device. Zone programming is described in Section 4.15 below.

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:

à 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.

For the Cable Version of the EAS 911:

Press the SUBDIVISION key.

ZONE: ♥ *code* appears on the LCD, when code is ALL or 1 to 16.

Use the arrow keys (Δ ∇) to scroll through the list of 16 zones.

Select a zone for auto forward by pressing the ENTER key. The presence of the ♥ indicates that the zone is selected. Pressing the ENTER key will toggle the diamond (♥) to change the status of each zone

Press EXIT to confirm and end.

4.16 NOT AVAILABLE

4.17 NOT AVAILABLE

4.18 VOICE RECORDER INSTALLED?

Verify the presence of the 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.

4.19 NOT AVAILABLE

4.20 NOT AVAILABLE

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 **STD.** It will then scroll the following: *Standard TFT I/F for BSS, Frontline, and D Co. EAS Systems*

The following six submenus are available:

CHAR_GEN_I/F:OFF

STD *Standard TFT I/F for BSS, Frontline, and D Co. EAS Systems*

CODI Direct Interface to CHYRON CODI

VDS Direct Interface to VDS 840

ALT1 Alternate TFT I/F for Trilithic EAS Systems

ALT2 Alternate TFT I/F for Next Level EAS Systems

Use the Arrow keys to select the desired submenu, then press ENTER to select the displayed setting. ALTERNATE 1 commands are described in Appendix E.

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 ± 90)
SET SUBCA PHASE	SubC Phase = 0 (range exceeds ± 90)
SET KEY DELAY	Key Delay = 0 (range is ± 10)

If the VDS interface is selected by pressing ENTER when VDS I/F is displayed, you may use the arrow keys and ENTER to select the submenus 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.

SET CHAR HEIGHT	Height = 3 (range is 1 to 4)
SET COLOR	Color:White (also Yellow Cyan, ,Green, Magenta, Red, Blue or Black)

SET CRAWL SPEED	Speed = 2 (range is 1-3)
SET CRAWL TIME	Time = 1 (range is 1-9 min)
SET DISPLAY LINE	Line = 50 (range is 40-100)
SET VDS EDITOR	ON or OFF When ON, the ALERT RELAY will close during EAS transmission to control VDSs second COM port. The relay will stay closed until the VD's timeout. If it is OFF, all operation is normal.

4.22 NOT AVAILABLE

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 enabled. 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 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 NOT AVAILABLE

4.27 NOT AVAILABLE

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 diplayed 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.

4.30 ENABLE CG TEXT FOR RWT

This menu item allows the user to enable or disable the text output to an external character generator for the Required Weekly Test.

Press ENTER while **27. ENABLE C.G. TEXT FOR RWT** is displayed on the LCD Screen. **RWT CG: NO** will be displayed. Use the Δ or ∇ key to select RWT CG:YES if desired. Press ENTER when the desired setting is displayed.

4.31 SET AUTO MODE TIMER

This menu item allows the user to program the EAS 911 to automatically switch between AUTO and MANUAL mode at selected times.

Press ENTER while **28. SET AUTO MODE TIMER** is displayed on the LCD Screen. **AUTO MODE: OFF** will be displayed. Use the Δ or ∇ key to select **AUTO MODE: ON** if desired. Press ENTER when the desired setting is displayed.

If **AUTO MODE: ON** is selected, **SET AUTO ON** will be displayed next. Press ENTER to allow entry of time to switch AUTO mode ON. **AUTO ON: 00:00** will be displayed. Use the Δ and ∇ keys to select the hour, then press ENTER. Use the Δ and ∇ keys again to select the minute, then press ENTER. **SET AUTO ON** will now be displayed. Use the Δ and ∇ keys to display **SET AUTO OFF** and press ENTER to enter the time to switch AUTO mode OFF. **AUTO OFF: 00:00** will be displayed. Use the Δ and ∇ keys to select the hour, then press ENTER. Use the Δ and ∇ keys again to select the minute, then press ENTER. **SET AUTO OFF** will now be displayed. Press EXIT to return to the Setup Menu.

The AUTO/MANUAL mode can still be set manually from the front panel. However, if the Auto Mode Timer is enabled, it will override the mode at the first occurrence of the ON or OFF time. If the ON time is set equal to the OFF time, the Auto Mode Timer will have no effect on the mode.

4.32 RECORD ALERT VOICE MESSAGE

An alert voice message may be prerecorded for later playback with the next manually encoded or manually forwarded message. 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 2 minutes. This recording will be superceeded by the next EAS voice message.

Press ENTER while **29. RECORD ALERT VOICE MESSAGE** 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 message has been recorded, it will automatically be replayed. Press EXIT to end.

4.33 VERIFY ALERT VOICE MESSAGE

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

Press ENTER while **30. VERIFY ALERT VOICE MESSAGE** is displayed on the LCD Screen.

The SPKR LED will light to allow adjustment of speaker volume.

The LCD Screen will display: **ANNOUNCEMENT: 120** (or the length of the recorded announcement in seconds.

The speaker will play back the prerecorded message.

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

4.34 NOT AVAILABLE

4.35 NOT AVAILABLE

SECTION V
INSTALLATION

5.1 INTRODUCTION

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

Electrical ground for the EAS DECODER 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 DECODER is designed to mount in a 19" rack or cabinet using (4) 12-24 pan head machine screws.

Mounting requirements: Size: 5.25"H x 19"W x 10"D Maximum. Weight: Approximately 14 lbs.

Power requirements: Input power: 117 VAC @ 60 Hz, 50 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 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 DECODER Connections are made to the AUDIO OUTPUT, J4, with a standard XLR connector.

1. Enter the primary password. 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 DECODER 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	CH3 + AUDIO INPUT
2	CH3 SHIELD GROUND
3	CH3 - AUDIO INPUT
4	CH4 + AUDIO INPUT
5	CH4 SHIELD GROUND
6	CH4- 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 3.
2. Press the SPKR key to activate the speaker on Channel 3. 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 4, 5, 6 .

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 THE ON-AIR RELAY

The On-Air Relay operates (closes) 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 60DVC, 3A. Contacts are Normally Open. The relay can be used to control the TFT Model 940 Program/Transmitter Interrupt unit.

The On-Air Relay closes only when the 911D transmits a header, attention signal, voice recording, or EOM.

5.7 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.

5.8 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 DECODER 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.

5.9 NOT AVAILABLE

5.10 NOT AVAILABLE

5.11 NOT AVAILABLE

5.12 NOT AVAILABLE

5.13 COMM EXPANDER, FIELD INSTALLATION

The optional COMM Expander can be plugged into the EAS Decoder Main PCB J113 Connector . It provides communication links to the following EAS 911D related equipment.

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.

5.14 FRONT PANEL PRINTER, FIELD INSTALLATION

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

5.15 NOT AVAILABLE

SECTION VI
OPERATION

6.1 INTRODUCTION

This section describes EAS DECODER operating procedures.

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

6.2 LEFT SECTION

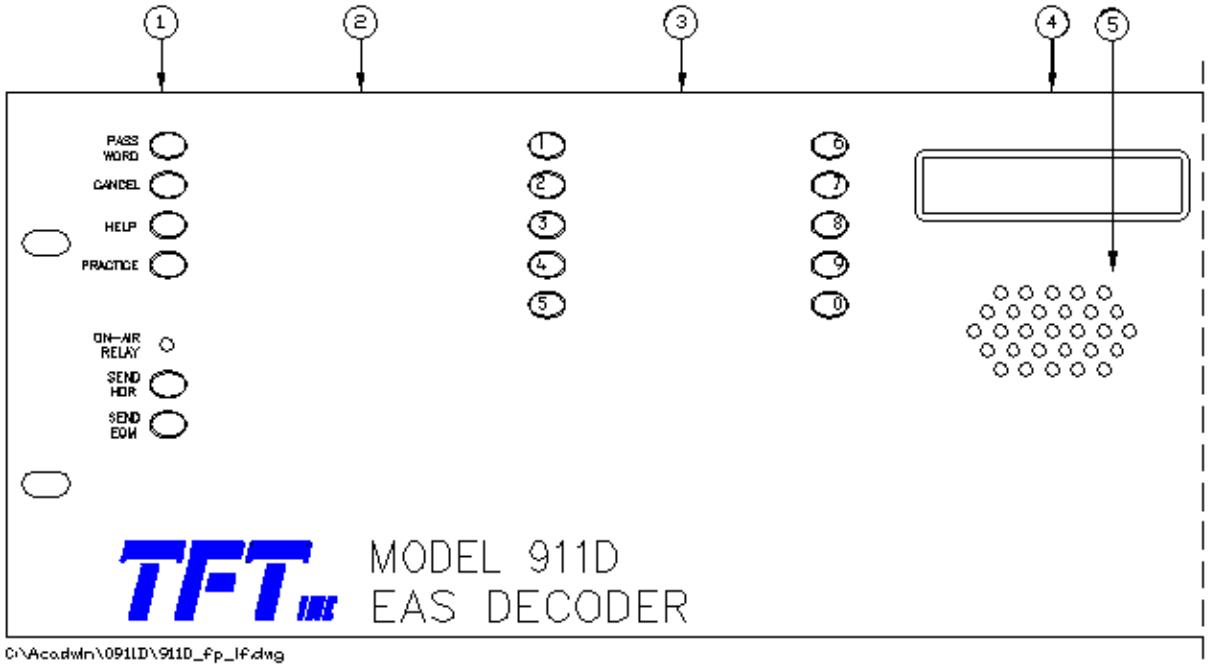


Figure 6-1. Front Panal Left Section Controls and Indicators

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 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 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 DECODER Help Menus

10. Password Help

101 Access to Encoder

102 Access to Setup Menu

103 To Change Passwords

104 Password Lost

20. Encoder Operation Help

201 **NOT AVAILABLE**

202 **NOT AVAILABLE**

203 **NOT AVAILABLE**

204 **NOT AVAILABLE**

205 **NOT AVAILABLE**

206 **NOT AVAILABLE**

207 **NOT AVAILABLE**

208 **NOT AVAILABLE**

209 **NOT AVAILABLE**

210 **NOT AVAILABLE**

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

40. Audio/Printer Operation Help

401 To Set Output Level On-Air

402 To Set Output Level Off-Air

403 Speaker Volume Adjustment

404 To Print Screen

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 **NOT AVAILABLE**

509 **NOT AVAILABLE**

510 **NOT AVAILABLE**

60. Decoder Setup Help

601 To Select Events to Auto Forward

602 To Add Locations to Auto Forward

603 To Verify or Delete Locations to Auto Forward

70. Accessory Setup Help

701 To Enable Character Generator Interface

702 Voice Recorder Status

703 **NOT AVAILABLE**

704 To Record Voice Announcement

705 To Verify Voice Announcement

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

6.2.2 Not available

6.2.3 Not available

6.2.4 Not available

6.2.5 Not available

6.2.6 Use of the CANCEL Key

The CANCEL key may be used to return to a previous entry mode. During transmission of manually forwarded messages, CANCEL may be pressed to deactivate the ON-AIR relay and abort message transmission.

THE cancel key may be used to extinguish the flashing MSG WAITING LED when a message is not to be forwarded. Press the flashing MSG button once to advance to MANUAL FWD, then press the CANCEL button to cancel the flashing MSG WAITING LED.

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

The Practice mode permits use of the EAS DECODER 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 DECODER 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 DECODER, 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 Δ and Down ∇ Arrow Keys

The Up Δ and Down ∇ 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 forwading 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 Front Panel Right Section

The front panel right 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 Front Panel Right Section are shown in Figure 6.3-1.

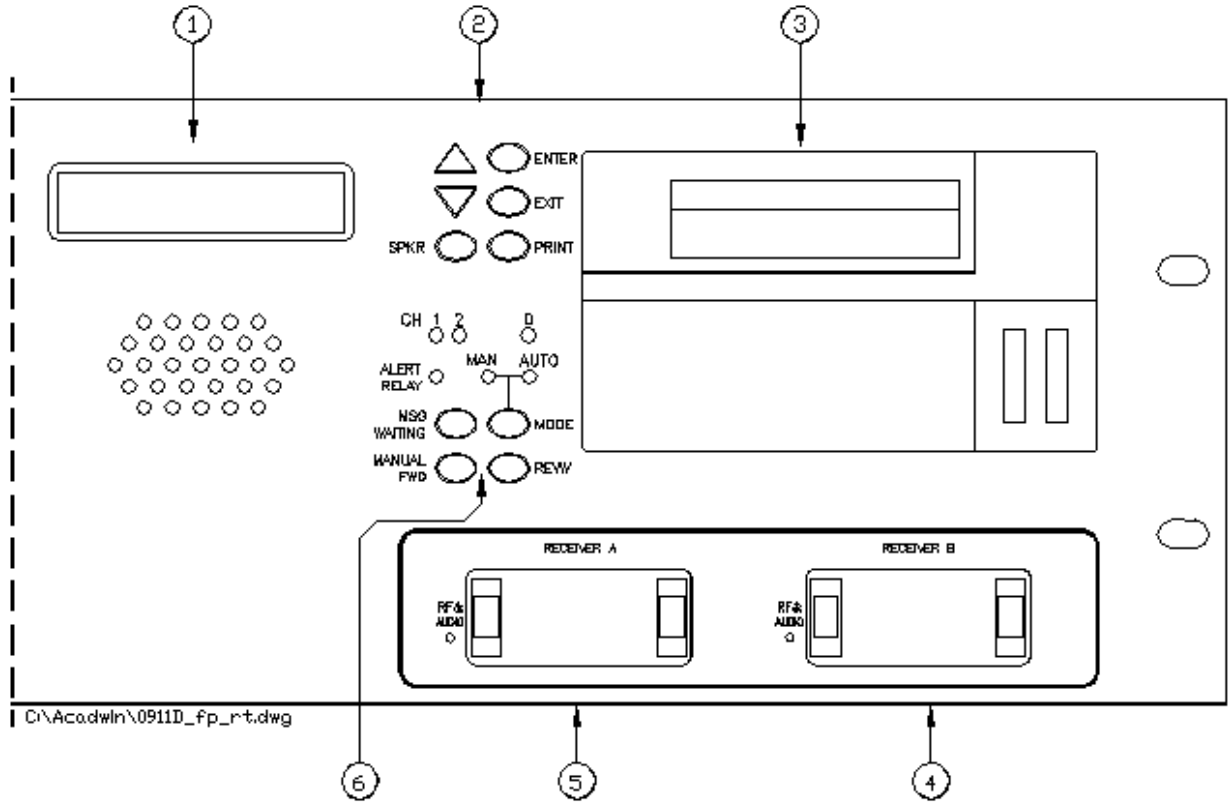


Figure 6.3-1 Decoder Controls and Indicators

THIS THIS THIS

6.4.1 LED Indicators

The LED Indicators monitor audio activity on Channels 1 and 2. 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 DECODER 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.

6.4.6 Message Priority

The Decoder uses an internal priority scheme to determine how to process multiple messages. The four levels of priority are:

a. National events (EAN/EAT):

National events have the highest priority and will interrupt all other events that are in progress, regardless of whether they have been queued through the Message Hold feature (see 6.5.9).

b. Normal events (Flood, Blizzard, etc.):

Normal events will be interrupted by new (different) events, unless the original event is in the process of being auto-forwarded. In Manual mode, the original event may be queued by the operator to prevent a new event from interrupting the manual forward process until it is completed.

c. Test messages (RWT and DMO):

Test messages can be forwarded (manually or automatically) if another event is not in progress, but will not interrupt a Normal or National evene for 15 minutes after it is received, or until that event has been forwarded.

d. Duplicate and Expired messages:

Duplicate (identical to a previously received messasge, except for Station ID) and Expired (duration of the event has expired) messages have the lowest priority, and are placed in the Receive Log and printed. They canot be forwarded and will not interrupt another message.

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; 3.) Permits adjustment of the output audio signal level; 4.) Provides options for Printer and Message handling; and 5) Permits testing of cable RF Modulator.

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.

6.5.8 Set Printer Operation

This menu item selects which messages will be printed. Use the arrow keys to scroll to **7 SET PRINTER OPERATION**. Press ENTER. Use the arrow keys to select ALL, SELECTIVE, or HOLD. ALL (default) will print all messages; SELECTIVE prints all outgoing messages, but only those incoming messages with Events/Locations selected for auto

forwarding. HOLD disables the printer. When HOLD is deselected, messages stored in the transmit and receive logs will resume printing.

6.5.9 Set Message Hold

This menu item permits the most recently decoded forwardable message to be queued manually for output, locking out all other messages except a national emergency.

Use the Arrow keys to scroll to **8. SET MESSAGE HOLD**, and press ENTER. **MESSAGE HOLD: NO** will be displayed. Use the Δ or ∇ key to display **MESSAGE HOLD:YES** if desired. Press ENTER when the desired setting is displayed to return to the Operation Menu.

If YES is selected and the EAS 911 is in MANUAL mode, the Message Hold mode is activated by pressing MESSAGE WAITING after a message has been decoded and the MESSAGE WAITING key is flashing. At this point, the display will indicate **Message Queued**, and other messages will be locked out until the message is manually forwarded or 15 minutes has passed. When the message is queued, it can be reviewed with the REVIEW key. Once activated, the **Message Queued** mode can be deactivated by press the MESSAGE WAITING key again.

6.5.10 Mark/Space Calibration

This Operation Menu item appears only in the EAS 911. It allows the user to set the RF output level of the Cable RF modulator.

Press the ENTER key when **9. MARK/SPACE CALIBRATION** appears on the LCD screen. The EAS 911 will transmit alternating Marks and Spaces, and **MARK/SPACE** will appear on the LCD screen. The output level can be adjusted with the modulation Attenuator on the rear panel. Press ENTER or EXIT to terminate the Mark/Space transmission.

SECTION VII

This section has been intentionally deleted.

SECTION VIII
AM/FM RECEIVER

8.1 Specifications

The EAS DECODER Receivers performance and physical specifications are listed in Table 8-1.

Table 8-1

SPECIFICATIONS

FM RECEIVER MODULE	
Frequency Range	88-108 MHz, digitally tunable in 100 kHz steps
Antenna Input	75?, Type F connector
Sensitivity	2 µV for 20 dB quieting
Audio Output	-10 dBm to +3 dBm (adjustable from rear panel) 600? balanced, 3-pin terminal block
T.H.D.	Less than 3% at 66.6% modulation
AM RECEIVER MODULE	
Frequency Range	540 kHz to 1720 kHz, digitally tunable in 10 kHz steps
Antenna Input	Terminal block connector; external AM loop antenna supplied
Sensitivity	20 µV for 20 dB S/N
AGC	45 dB
Audio Output	-10 dBm to +3 dBm (adjustable from rear panel) 600? balanced, 3-pin terminal block
T.H.D.	Less than 3% at 66.6% modulation

8.2 AM Receiver Module Block Diagram Description

The AM Receiver module is tunable from 540 to 1720 kHz in 10 kHz steps. Audio output for external use is balanced 600 ohms at up to +3 dBm. Tuning is via three rotary DIP switches which are accessible by removing the associated front panel cover plate. An LED lights to show RF signal presence and audio output.

Figure 8-1 is a block diagram of the AM Receiver module. (See Figure A-3 in Appendix A for the schematic diagram.) The following is a summary of the operating principles of this module.

a. The AM Receiver module receives 540 to 1720 kHz AM program signals at its rear panel RF INPUT connector. The RF signal is routed to U1, the front end block consisting of a mixer, a voltage-controlled oscillator (VCO), a 450 kHz IF filter, and an AM Detector.
b. The selected audio signal is amplified by U2 and sent to the BALANCED AUDIO OUTPUT terminal block connector on the rear panel. The audio output level of U2 is preset by manufacturer.

c. Frequency selection in 10 kHz steps is performed by a 3-digit BCD rotary DIP switch together with microprocessor U6 and a PLL frequency synthesizer consisting of U4, U5, Q1 and other components.
d. The output at pin 5 of U1 is a DC voltage analog of the RSSI (RF level) of the input signal. This output can be measured at TP1 using a DC voltmeter.
e. A DC sample of the RF signal level is routed to one input of comparator U3A; the other input is supplied from reference voltage V_{REF2}. A sample of the audio output level is routed to one input of comparator U3B; the other input is supplied from reference voltage V_{REF1}. When the RF signal level exceeds the reference voltage and the audio signal level exceeds the minimum requirements, the LED lights.

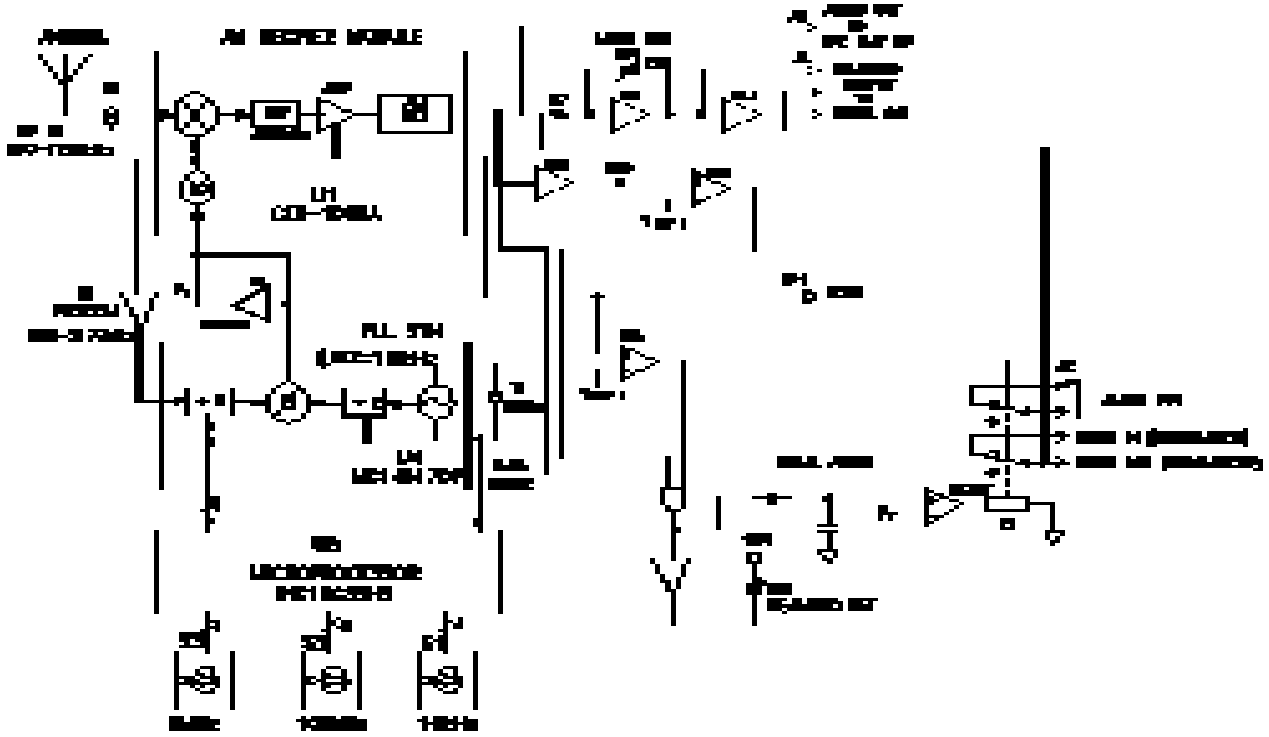


Figure 8-1. AM Receiver Module - Block Diagram

8.3 FM Receiver Block Diagram Description

The FM Receiver module is tunable from 88 to 108 MHz in 100 kHz steps. Audio output for external use is balanced 600 ohms at up to +3 dBm. Tuning is via three rotary switches which are accessible by removing the associated front panel cover plate. An LED lights to show adequate RF signal level and the presence of audio modulation.

Figure 8-2 is a block diagram of the FM Receiver module. (See Figure A-5 in Appendix A for the schematic diagram.) The following is a summary of the operating principles of this module.

a. The FM Receiver module receives 88 to 108 MHz FM program signals at its rear panel RF INPUT connector. The RF signal is routed to front end block U1 consisting of a mixer, a voltage-controlled oscillator (VCO), a 10.7 MHz IF filter, and an FM Detector and other components.
b. The selected audio signal from U1 is amplified by U3 and sent to a BALANCED AUDIO OUTPUT terminal block connector on the rear panel. The audio output level from the Receiver board is preset by manufacture.
c. Frequency selection is performed by a 3-digit rotary DIP switch along with microprocessor U7 and a PLL synthesizer consisting of U5, U6, Q1, Q2, and other components.
d. The output at pin 10 of U1 is a DC voltage analog of the RSSI (RF level) of the input signal. This output can be measured by using a DC voltmeter at TP1 which is accessible by removing the associated front panel cover plate.

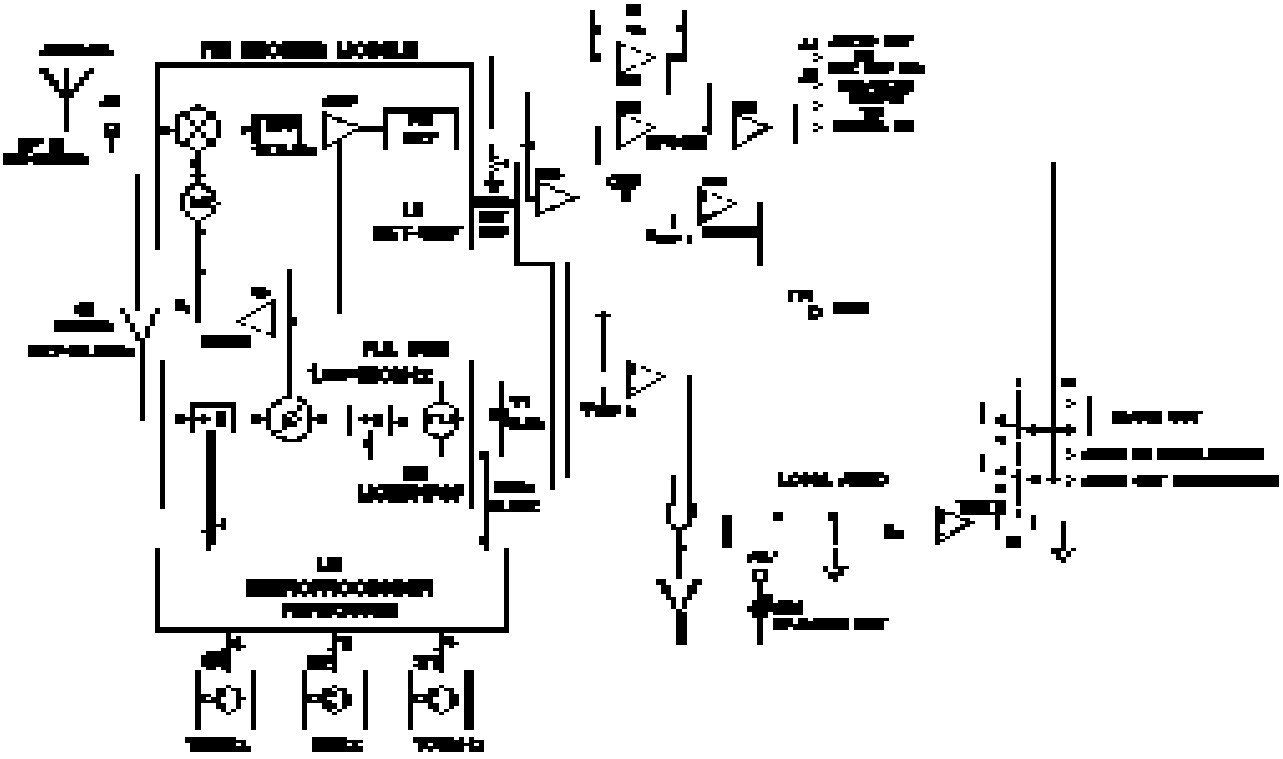
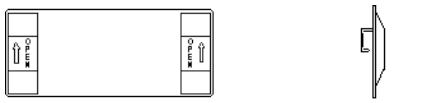
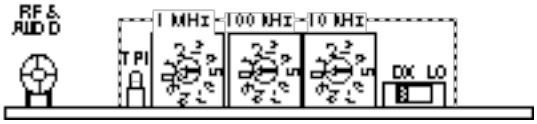
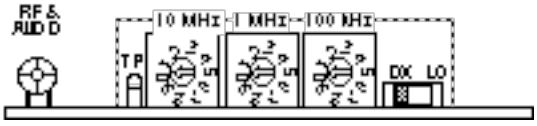


Figure 8-2. FM Receiver Module - Block Diagram

Table 8-2. Receiver Front Panel Controls and Indicators

ITEM	TITLE	FUNCTION
		Note: Individual Receiver controls are accessible by removing the associated push-on cover (shown below) from the front panel. To remove the cover, push it upward to disengage its rear hooks, then pull gently forward to remove it from the front panel.  FRONT VIEW SIDE VIEW
4	AM RECEIVER	Receiver module for AM broadcast band (540 - 1720 kHz)  Figure 8-3. AM Receiver Module Edge-Mounted Controls and Indicators
	RF & AUDIO	
	TP1	Yellow LED. Flashes when an RF signal is detected which is above the minimum level of 20 µV and has audio modulation.
	1 MHz, 100 kHz, 10 kHz	Test point for RF Signal Strength Indication (RSSI) monitoring
	DX/LO	Rotary switches for setting receive frequency Local/Distant switch for setting receiver sensitivity
5	FM RECEIVER	Receiver module for FM broadcast band (88 - 108 MHz)  Figure 8-4. FM Receiver Module Edge-Mounted Controls and Indicators
	RF & AUDIO	
	TP1 10 MHz, 1 MHz, 100 kHz	Yellow LED. Flashes when an RF signal is detected which is above the minimum level of 10 µV and has audio modulation.
	DX/LO	Test point for RF Signal Strength Indication (RSSI) monitoring Rotary switches for setting received frequency Local/Distant switch for setting receiver sensitivity

8.4 Rear Panel Controls and Connectors

Receiver rear panel controls and connectors are shown in Figure 8-5. Numbered items in this figure are explained in Table 2.3-3 item 10 to 15.

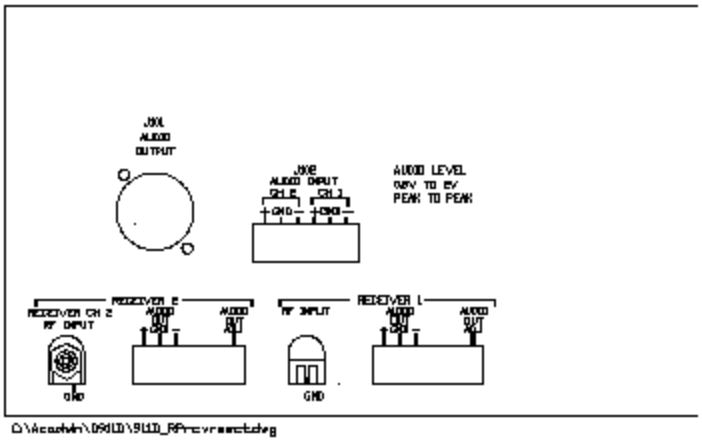


Figure 8-5. Receiver Section Rear Panel Controls and Connectors

8.5 FM Radio Antenna Installation

The FM Receivers can typically share an outdoor VHF antenna. The antenna output is applied to an FM/TV 2-way signal splitter which is supplied with the EAS DECODER. The type of VHF antenna can be a Radio Shack VHF/FM Stereo antenna, Part No. 15-2158 or Part No. 15-2164 for shorter receiving distances.
The splitter outputs are fed to the EAS DECODER FM Receiver inputs.

8.6 AM Antenna Installation

In high or moderate signal strength areas, the AM Receiver may operate satisfactorily using the indoor loop antenna supplied with the EAS DECODER. In weaker signal strength areas, an outdoor antenna may be required. An end-fed long-wire antenna (approximately 250 ft.) can be used with good results. One end of the long wire should be connected at the rear panel AM Receiver module's RF INPUT.

8.7 Received Signal Strength Indication (RSSI)

Test Point TP1 located next to the frequency selection switches on each receiver module is the RSSI voltage of the receiver. The characteristics of the RSSI vs. the RF signal level at the input of the receiver is shown in Figures 8-6 and 8-7 for the FM, and AM Receiver, respectively.

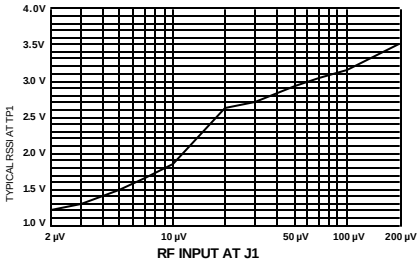


Figure 8-6
FM Receiver RSSI vs. RF Input

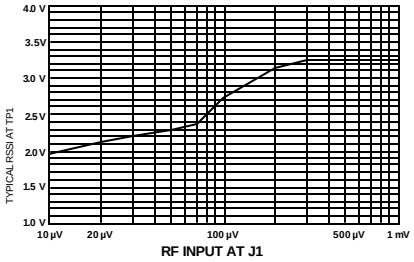


Figure 8-7
AM Receiver RSSI vs. RF Input

For reliable reception, the signal level from the antenna feed line must be high enough to provide an RSSI voltage greater than the values given below.

FM Receiver	> 1.9 VDC
AM Receiver	> 2.1 VDC

The LOCAL/DISTANT switch should be set to the DX (Distant) position unless the RSSI exceeds the values given below:

FM Receiver	> 3.8 VDC
AM Receiver	> 3.2 VDC

SECTION IX

THEORY OF OPERATION

9.1 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 is sues 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.
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.

9.2 The EAS DECODER: An Overview

The EAS DECODER is similar to a smart telephone answering machine. It receives and screens messages on one or two, 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) and logged on the printer. 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 DECODER 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 9.2 for a simplified block diagram of the EAS DECODER.

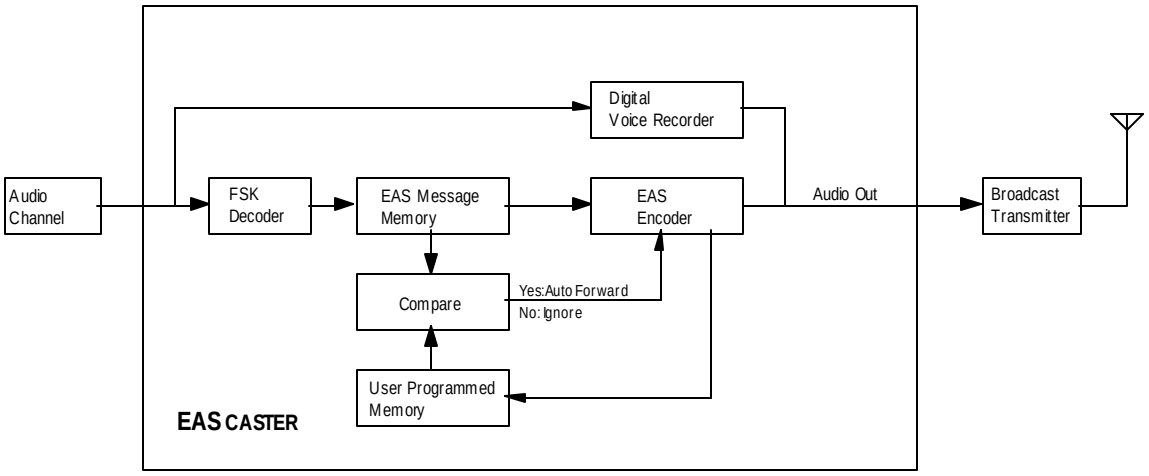


Figure 9.2, EAS DECODER Block Diagram

9.3 A Closer Look: Detailed System Block Diagram

The EAS DECODER system consists of the Main Board, the Encoder and Decoder keyboards, the LCD Display Assembly, the Digital Voice Recorder, the Comm Expander and the Printer. Figure 1 in Appendix A illustrates the EAS DECODER system blocks in detail.

9.4 Main Board (Figure 2, Appendix A)

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

9.4.1 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 (6601-4060).

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.

9.4.2 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 (6601-4060).

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.

9.4.3 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 (6601-4060).

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.

9.5 Left Section Key Pad (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.

9.6 Right Section Key Pad (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.

9.7 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.

9.8 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.

9.9 Printer

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

9.10 COM Port Expander (Figure 12, Appendix A)

An COM Port Expander provides communication links to external EAS DECODER 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 COM2 outputs through EIA quad line driver U306. They receive data from COM2 from EIA quad line receiver U305. The DUARTs are controlled by the FPGA on the main board.

SECTION X
MAINTENANCE AND REPAIR

10.1 INTRODUCTION

The EAS DECODER 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.

10.2 TOOL AND TEST EQUIPMENT REQUIREMENTS

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

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

10.3 ROUTINE MAINTENANCE

The EAS DECODER should require no routine maintenance other than printer paper and ribbon replacement. As equipment and systems external to the EAS DECODER change, audio level adjustments may be necessary. In addition, the real time clock contains a lithium battery that will require replacement after a number of years. Refer to Paragraph 10.3.3 for battery replacement procedure.

10.3.1 Calibration

The EAS DECODER requires no routine calibration.

10.3.2 Audio Levels

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

10.3.2.1 Audio Output Level Adjustment

This procedure sets the proper signal level at the audio output of the EAS DECODER (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 (Δ∇) 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 Δ∇ 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 Δ TIME ↑↓ arrows. The 960 Hz tone, both, or the 853 Hz tone can be selected.
5. Press EXIT to return to the Ready mode.

10.3.2.2 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.

10.3.3 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 DECODER, the battery is contained within U15. Contact TFT for replacement information

CAUTION

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.

10.4 PRINTER

10.4.1 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.

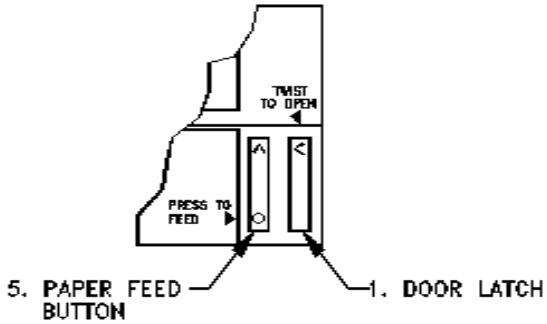
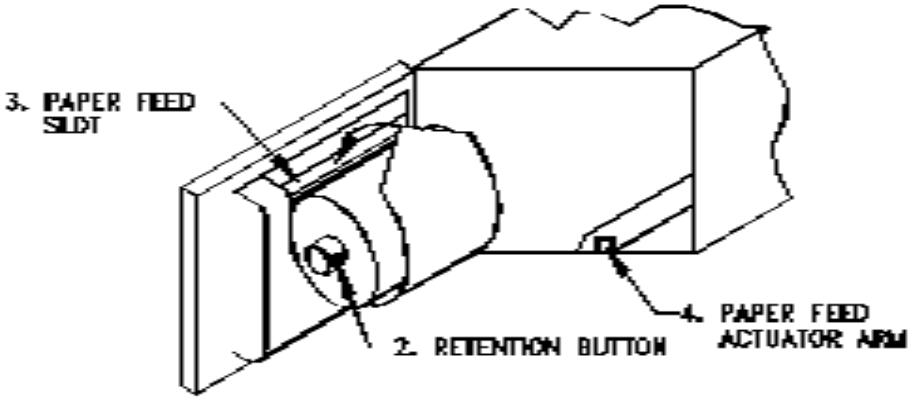


Figure 10.4-1. Printer Controls

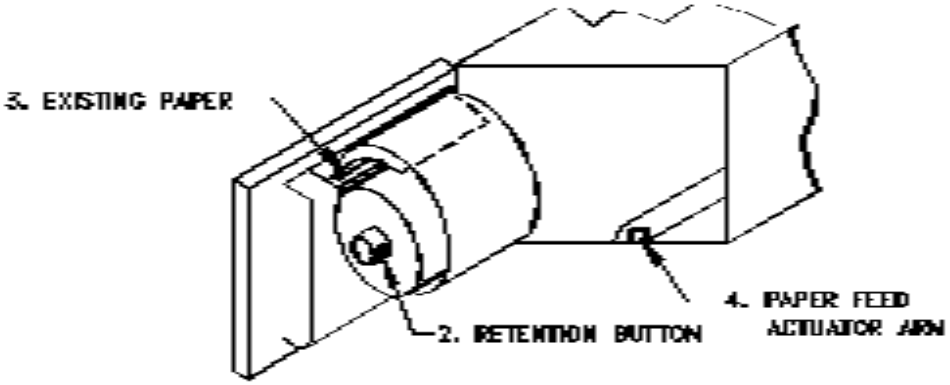
10.4.2 Paper Roll Replacement

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 10.4-2. Paper Roll Replacement

10.4.3 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 10.2 item (3). Swing the chassis back leaving the door fully open. This will expose the printer mechanism and ink ribbon cartridge. Refer to figure 10.4-3.

(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.

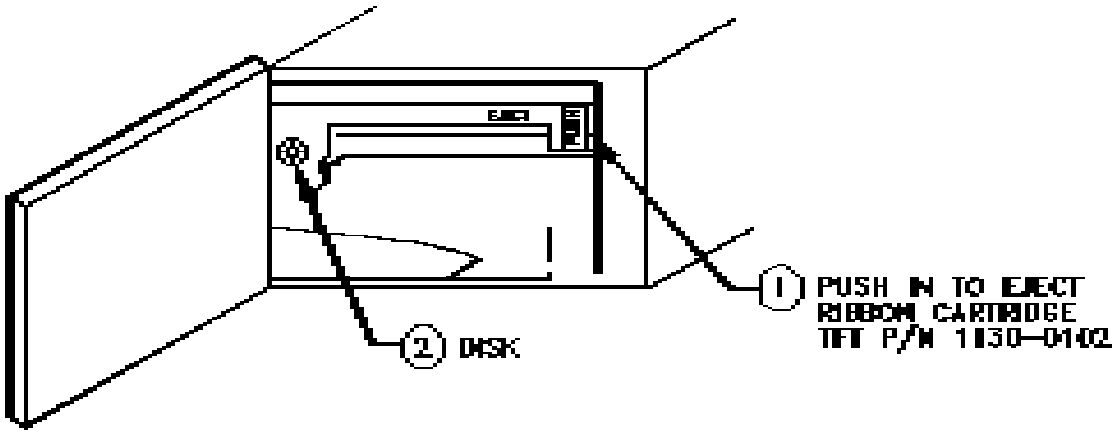


Figure 10.4-3. Ribbon Cartridge Replacement

10.4.4 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 10.4.4-1, while ribbon cartridge supplies are listed in Table 10.4.4-2.

Table 10.4.4-1 Paper Roll Suppliers

Item	Paper Roll Distributors	Catalog/Stock No.	Manufacturer and Part No.
1	McWhorter's 1-800-426-1368	SPR 01121	Sparco 01121
2	Office Depot 1-800-519-7222	523-423	Offic Depot OD225150AD
3	TFT, Inc. 408-727-7272 Ext. 300/205 408-988-3988 FAX	1130-0103 EAS	Able Systems A160-PR

- The paper width is 2-1/4"
- The inside diameter of the spool hole is .438" or .500"
- The TFT/Able paper roll outside diameter is 1.9"

If the paper roll diameter is greater than 2", remove paper until the diameter is less than 2".

Table 8.4.4-2 Ribbon Cartridge Suppliers

Item	Ribbon Cartridge Distributors	Catalog/Stock No.	Manufacturer and Part No.
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

10.5 DIAGNOSTICS AND REPAIR

Since most EAS DECODER 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 DECODER series of equipment uses static sensitive components. ESD (Electrostatic Discharge) precautions must therefore be observed during repairs. This is extremely important.
2. The EAS DECODER 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 VIX) is helpful in understanding how the EAS DECODER equipment functions and will help you with diagnostics, as it covers the jobs performed by each major component and subsystem.

10.6 TROUBLESHOOTING

Most of the EAS DECODER functions can be troubleshot by performing an Encoder (TFT Model 911) to Decoder (TFT Model 911D) test as described below.

Press the following keys from TFT Model 911: 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 DECODER will return to the Ready Banner (Banner) Mode.

10.7 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.

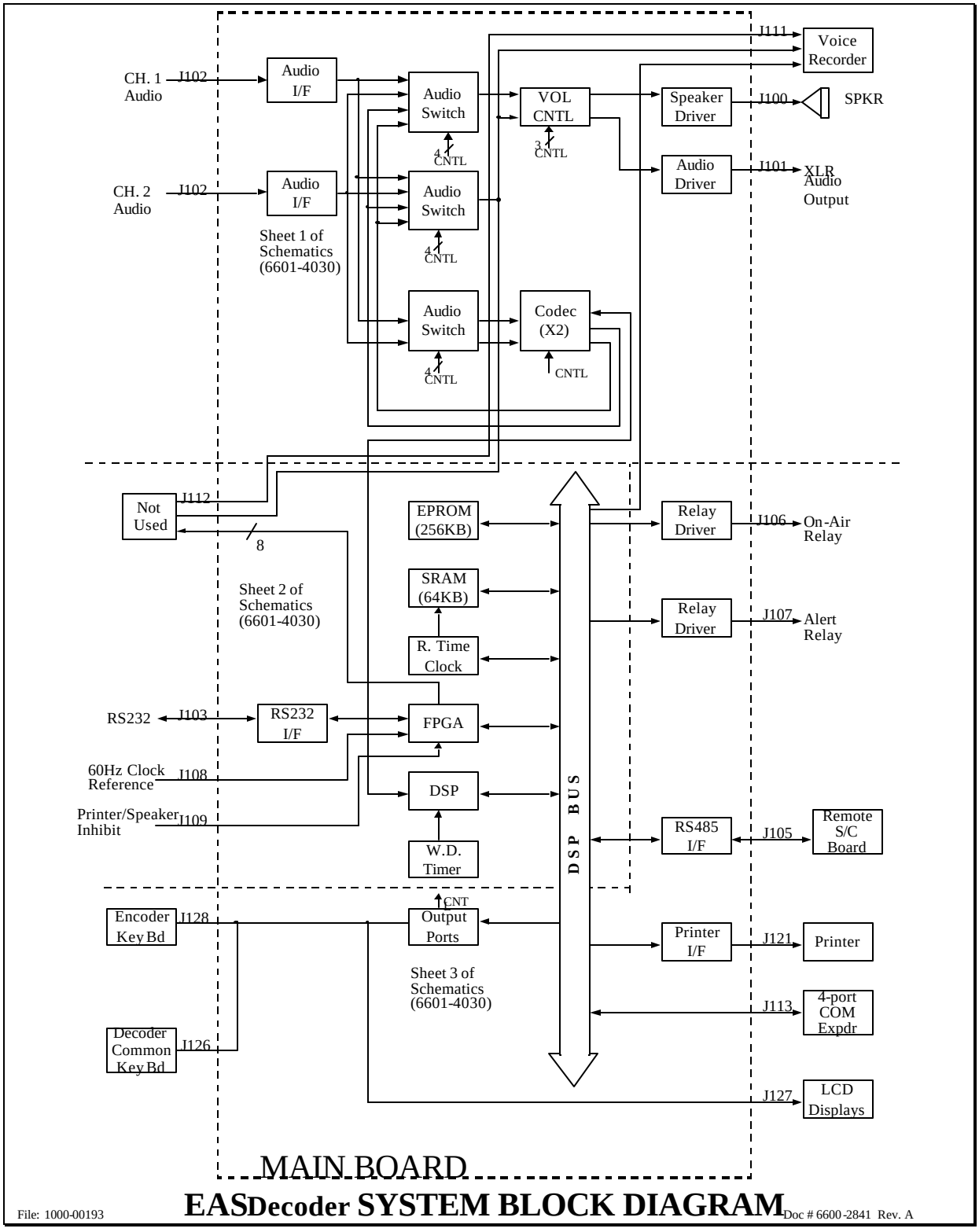
2243 Ringwood Avenue

San Jose, CA 95131

Telephone: (408) 943-9323, Fax: (408) 432-9218

APPENDIX A
ENGINEERING DRAWINGS

FIG.	TITLE	DWG NO.	REV.
1.	EAS Decoder System Block Diagram	6600-2840	A
2.	Main Board Schematic	6601-4060	A
3.	Main Board Assembly	6608-4060	A
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



File: 1000-00193

EASDecoder SYSTEM BLOCK DIAGRAM

Doc # 6600-2841 Rev. A

APPENDIX B
PARTS LISTS

TITLE	DWG NO.	REV.
Main PCB	6608-4060	A
Encoder PCB	6608-4027	C
Decoder PCB	6608-4028	C
Voice Recorder PCB	6608-4016	E
COM Port Expander PCB	6608-4061	A

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

The SSCCC 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

Part B - U. S. Territories FIPS Codes

Part C – Offshore (Marine Area) FIPS Codes

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	MOHAVE	04015	SANTA CRUZ	04023
COCHISE	04003	GREENLEE	04011	NAVAJO	04017	YAVAPAI	04025
COCONINO	04005	LA PAZ	04012	PIMA	04019	YUMA	04027
GILA	04007	MARICOPA	04013	PINAL	04021		

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
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	LA PLATA	08067	PUEBLO	08101
ALAMOSA	08003	DOUGLAS	08035	LARIMER	08069	RIO BLANCO	08103
ARAPAHOE	08005	EAGLE	08037	LAS ANIMAS	08071	RIO GRANDE	08105
ARCHULETA	08007	ELBERT	08039	LINCOLN	08073	ROUTT	08107
BACA	08009	EL PASO	08041	LOGAN	08075	SAGUACHE	08109
BENT	08011	FREMONT	08043	MESA	08077	SAN JUAN	08111
BOULDER	08013	GARFIELD	08045	MINERAL	08079	SAN MIGUEL	08113
BROOMFIELD	008014	GILPIN	08047	MOFFAT	08081	SEDGWICK	08115
CHAFFEE	08015	GRAND	08049	MONTEZUMA	08083	SUMMIT	08117
CHEYENNE	08017	GUNNISON	08051	MONTROSE	08085	TELLER	08119
CLEAR CREEK	08019	HINSDALE	08053	MORGAN	08087	WASHINGTON	08121
CONEJOS	08021	HUERFANO	08055	OTERO	08089	WELD	08123
COSTILLA	08023	JACKSON	08057	OURAY	08091	YUMA	08125
CROWLEY	08025	JEFFERSON	08059	PARK	08093		
CUSTER	08027	KIOWA	08061	PHILLIPS	08095		
DELTA	08029	KIT CARSON	08063	PITKIN	08097		
DENVER	08031	LAKE	08065	PROWERS	08099		

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		

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	MIAMI-DADE	012086	SUWANNEE	12121
COLLIER	12021	HIGHLANDS	12055	MONROE	12087	TAYLOR	12123
COLUMBIA	12023	HILLSBOROUGH	12057	NASSAU	12089	UNION	12125
DADE	12025	HOLMES	12059	OKALOOSA	12091	VOLUSIA	12127
DE SOTO	12027	INDIAN RIVER	12061	OKEECHOBEE	12093	WAKULLA	12129
DIXIE	12029	JACKSON	12063	ORANGE	12095	WALTON	12131
DWAL	12031	JEFFERSON	12065	OSCEOLA	12097	WASHINGTON	12133
ESCAMBIA	12033	LAFAYETTE	12067	PALM BEACH	12099		
				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	TELFAIR	13271
BRYAN	13029	FANN1N	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	WILLLEMSON	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
DAVIESS	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	MlAMI	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
KENTUCKY (Continued)							
CLINTON	21053	JESSAMINE	21113	MONTGOMERY	21173	WEBSTER	21233
CRITTENDEN	21055	JOHNSON	21115	MORGAN	21175	WHITLEY	21235
CUMBERLAND	21057	KENTON	21117	MUHLENBERG	21177	WOLFE	21237
DAVIESS	21059	KNOTT	21119	NELSON	21179	WOODFORD	21239

LOUISIANA							
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	NATCHITOCHES	22069	SAINT MARY	22101
ASSUMPTION	22007	EVANGELINE	22039	ORLEANS	22071	SAINT TAMMANY	22103
AVOYELLES	22009	FRANKLIN	22041	OUACHITA	22073	TANGIPAHOA	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	SA1NT HELENA	22091	WEST CARROLL	22123
CONCORDIA	22029	LINCOLN	22061	SA1NT JAMES	22093	WEST FELICIANA	22125
DE SOTO	22031	LIVINGSTON	22063	ST JOHN THE BAPTIST	22095	WINN	22127

MAINE							
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

MARYLAND							
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

MASSACHUSETTS							
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		

MICHIGAN							
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
ANTItIM	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	GRATIOT	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	KITTSON	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	DAVIESS	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	PHELPS	29161	WASHINGTON	29221

CLAY	29047	LACLEDE	29105	PIKE	29163	WAYNE	29223
CLINTON	29049	LAFAYETTE	29107	PLATTE	29165	WEBSTER	29225
COLE	290S1	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	31067	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	EDDY	35015	LUNA	35029	SAN JUAN	35045
CATRON	35003	GRANT	35017	MCKINLEY	35031	SAN MIGUEL	35047
CHAVES	35005	GUADALUPE	35019	MORA	35033	SANTA FE	35049
CIBOLA	35006	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
NEW MEXICO (Continued)							
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	CASS	38017	GOLDEN VALLEY	38033	MCHENRY	38049
BARNES	38003	CAVALIER	38019	GRAND FORKS	38035	MCINTOSH	38051
BENSON	38005	DICKEY	38021	GRANT	38037	MCKENZIE	38053
BILLINGS	38007	DIVIDE	38023	GRIGGS	38039	MCLEAN	38055
BOTTINEAU	38009	DUNN	38025	HETTINGER	38041	MERCER	38057
BOWMAN	38011	EDDY	38027	KIDDER	38043	MORTON	38059
BURKE	38013	EMMONS	38029	LA MOURE	38045	MOUNTRAIL	38061
BURLEIGH	38015	FOSTER	38031	LOGAN	38047	NELSON	38063
NORTH DAKOTA (Continued)							
OLIVER	38065	RICHLAND	38077	STARK	38089	WARD	38101
PEMBINA	38067	ROLETTE	38079	STEELE	38091	WELLS	38103
PIERCE	38069	SARGENT	38081	STUTSMAN	38093	WILLIAMS	38105
RAMSEY	38071	SHERIDAN	38083	TOWNER	38095		
RANSOM	38073	SIOUX	38085	TRAILL	38097		
RENVILLE	38075	SLOPE	38087	WALSH	38099		

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	UN1ON	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	CLACKAMAS	41005	COLUMBIA	41009	CROOK	41013
BENTON	41003	CLATSOP	41007	COOS	41011	CURRY	41015
OREGON (Continued)							
DESCHUTES	41017	JEFFERSON	41031	MALHEUR	41045	UMATILLA	41059
DOUGLAS	41019	JOSEPHINE	41033	MARION	41047	UNION	41061
GILLIAM	41021	KLAMATH	41035	MORROW	41049	WALLOWA	41063
GRANT	41023	LAKE	41037	MULTNOMAH	41051	WASCO	41065
HARNEY	41025	LANE	41039	POLK	41053	WASHINGTON	41067
HOOD RIVER	41027	LINCOLN	41041	SHERMAN	41055	WHEELER	41069
JACKSON	41029	LINN	41043	TILLAMOOK	41057	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							
AURORA	46003	CHARLES MIX	46023	EDMUNDS	46045	HUGHES	46065
BEADLE	46005	CLARK	46025	FALL RIVER	46047	HUTCHINSON	46067
BENNETT	46007	CLAY	46027	FAULK	46049	HYDE	46069
BON HOMME	46009	CORSON	46031	GRANT	46051	JACKSON	46071
BROOKINGS	46011	CUSTER	46033	GREGORY	46053	IERAULD	46073
BROWN	46013	DAVISON	46035	HAAKON	46055	JONES	46075
BRULE	46015	DAY	46037	HAMLIN	46057	KINGSBURY	46077
BUFFALO	46017	DEUEL	46039	HAND	46059	LAKE	46079
BUTTE	46019	DEWEY	46041	HANSON	46061	LAWRENCE	46081
CAMPBELL	46021	DOUGLAS	46043	HARDING	46063	LINCOLN	46083
SOUTH DAKOTA (Continued)							
LYMAN	46085	MINNEHAHA	46099	SHANNON	46113	UNION	46127
MCCOOK	46087	MOODY	46101	SPINK	46115	WALWORTH	46129
MCPHERSON	46089	PENNINGTON	46103	STANLEY	46117	YANKTON	46135
MARSHALL	46091	PERKINS	46105	SULLY	46119	ZIEBACH	46137
MEADE	46093	POTTER	46107	TODD	46121		
MELLETTE	46095	ROBERTS	46109	TRIPP	46123		
MINER	46097	SANBORN	46111	TURNER	46125		

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
BLEDSOE	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	BRISCOE	48045	COLLINGSWORTH	48087	DUVAL	48131
ANDREWS	48003	BROOKS	48047	COLORADO	48089	EASTLAND	48133
ANGELINA	48005	BROWN	48049	COMAL	48091	ECTOR	48135
ARANSAS	48007	BURLESON	48051	COMANCHE	48093	EDWARDS	48137
ARCHER	48009	BURNET	48053	CONCHO	48095	ELLIS	48139
ARMSTRONG	48011	CALDWELL	48055	COOKE	48097	EL PASO	48141
ATASCOSA	48013	CALHOUN	48057	COTTLE	48101	ERATH	48143
AUSTIN	48015	CALLAHAN	48059	CRANE	48103	FALLS	48145
BANDERA	48019	CAMERON	48061	CROCKETT	48105	FANNIN	48147
BASTROP	48021	CAMP	48063	CROSBY	48107	FAYETTE	48149
BAYLOR	48023	CARSON	48065	CULBERSON	48109	FISHER	48151
BEE	48025	CASS	48067	DALLAM	48111	FLOYD	48153
BELL	48027	CASTRO	48069	DALLAS	48113	FOARD	48155
BEXAR	48029	CHAMBERS	48071	DAWSON	48115	FORT BEND	48157
BLANCO	48031	CHEROKEE	48073	DEAF SMITH	48117	FRANKLIN	48159
BORDEN	48033	CHILDRESS	48075	DELTA	48119	FREESTONE	48161
BOSQUE	48035	CLAY	48077	DENTON	48121	FRIO	48163
BOWE	48037	COCHRAN	48079	DE WITT	48123	GALVESTON	48167
BRAZORIA	48039	COKE	48081	DICKENS	48125	GARZA	48169
BRAZOS	48041	COLEMAN	48083	DIMMIT	48127	GILLESPE	48171
BREWSTER	48043	COLLIN	48085	DONLEY	48129	GLASSCOCK	48173
TEXAS (Continued)							
GOLIAD	48175	KENDALL	48259	MORRIS	48343	STARR	48427
GONZALES	48177	KENEDY	48261	MOTLEY	48345	STEPHENS	48429
GRAY	48179	KENT	48263	NACOGDOCHES	48347	STERLING	48431
GRAYSON	48181	KERR	48265	NAVARRO	48349	STONEWALL	48433
GREGG	48183	KIMBLE	48267	NEWTON	48351	SUTTON	48435
GRIMES	48185	KING	48269	NOLAN	48353	SWISHER	48437
GUADALUPE	48187	KINNEY	48271	NUECES	48355	TARRANT	48439
HALE	48189	KLEBERG	48273	OCHILTREE	48357	TAYLOR	48441
HALL	48191	KNOX	48275	OLDHAM	48359	TERRELL	48443
HAMILTON	48193	LAMAR	48277	ORANGE	48361	TERRY	48445
HANSFORD	48195	LAMB	48279	PALO PINTO	48363	THROCKMORTON	48447
HARDEMAN	48197	LAMPASAS	48281	PANOLA	48365	TITUS	48449
HARDIN	48199	LA SALLE	48283	PARKER	48367	TOM GREEN	48451
HARRIS	48201	LAVACA	48285	PARMER	48369	TRAVIS	48453
HARRISON	48203	LEE	48287	PECOS	48371	TRINITY	48455
HARTLEY	48205	LEON	48289	POLK	48373	TYLER	48457
HASKELL	48207	LIBERTY	48291	POTTER	48375	UPSHUR	48459
HAYS	48209	LIMESTONE	48293	PRESIDIO	48377	UPTON	48461
HEMPHILL	48211	LIPSCOMB	48295	RAINS	48379	UVALDE	48463
HENDERSON	48213	LIVE OAK	48297	RANDALL	48381	VAL VERDE	48465
HIDALGO	48215	LLANO	48299	REAGAN	48383	VAN ZANDT	48467
HILL	48217	LOVING	48301	REAL	48385	VICTORIA	48469

HOCKLEY	48219	LUBBOCK	48303	RED RIVER	48387	WALKER	48471
HOOD	48221	LYNN	48305	REEVES	48389	WALLER	48473
HOPKINS	48223	MCCULLOCH	48307	REFUGIO	48391	WARD	48475
HOUSTON	48225	MCLENNAN	48309	ROBERTS	48393	WASHINGTON	48477
HOWARD	48227	MCMULLEN	48311	ROBERTSON	48395	WEBB	48479
HUDSPETH	48229	MADISON	48313	ROCKWALL	48397	WHARTON	48481
HUNT	48231	MARION	48315	RUNNELS	48399	WHEELER	48483
HUTCHINSON	48233	MARTIN	48317	RUSK	48401	WICHITA	48485
IRION	48235	MASON	48319	SABINE	48403	WILBARGER	48487
JACK	48237	MATAGORDA	48321	SAN AUGUSTINE	48405	WILLACY	48489
JACKSON	48239	MAVERICK	48323	SAN JACINTO	48407	WILLIAMSON	48491
JASPER	48241	MEDINA	48325	SAN PATRICIO	48409	WILSON	48493
JEFF DAVIS	48243	MENARD	48327	SAN SABA	48411	WINKLER	48495
JEFFERSON	48245	MIDLAND	48329	SCHLEICHER	48413	WISE	48497
JIM HOGG	48247	MILAM	48331	SCURRY	48415	WOOD	48499
JIM WELLS	48249	MILLS	48333	SHACKELFORD	48417	YOAKUM	48501
JOHNSON	48251	MITCHELL	48335	SHELBY	48419	YOUNG	48503
JONES	48253	MONTAGUE	48337	SHERMAN	48421	ZAPATA	48505
KARNES	48255	MONTGOMERY	48339	SMITH	48423	ZAVALA	48507
KAUFMAN	48257	MOORE	48341	SOMERVELL	48425		

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

VIRGINIA							
ACCOMACK	51001	FAUQUIER	51061	MIDDLESEX	51119	MANASSAS CITY	51683
ALBEMARLE	51003	FLOYD	51063	MONTGOMERY	51121	NEWPORT NEWS CITY	51700
ALEXANDRIA CITY	51510	FLUVANNA	51065	NELSON	51125	NORFOLK CITY	51710
ALLEGHANY	51005	FRANKLIN	51067	NEW KENT	51127	NORTON CITY	51720
AMELIA	51007	FREDERICK	51069	NORTHAMPTON	51131	PETERSBURG CITY	51730
AMEERST	51009	GILES	51071	NORTHUMBERLAND	51133	SUSSEX	51183
APPOMATTOX	51011	GLOUCESTER	51073	NOTTOWAY	51135	TAZEWELL	51185
ARLINGTON	51013	GOOCHLAND	51075	ORANGE	51137	WARREN	51187
AUGUSTA	51015	GRAYSON	51077	PAGE	51139	WASHINGTON	51191
BATH	51017	GREENE	51079	PATRICK	51141	WESTMORELAND	51193
BEDFORD	51019	GREENSVILLE	51081	PITTSYLVANIA	51143	WISE	51195
BEDFORD CITY	51515	HALIFAX	51083	POWHATAN	51145	WYTHE	51197
BLAND	51021	HANOVER	51085	PRINCE EDWARD	51147	YORK	51199
BOTETOURT	51023	HENRICO	51087	PRINCE GEORGE	51149	CHESAPEAKE CITY	51550
BRISTOL CITY	51520	HENRY	51089	PRINCE WILLIAM	51153	CLIFTON FORGE CITY	51560
BRUNSWICK	51025	HIGHLAND	51091	PULASKI	51155	COLONIAL HEIGHTS CITY	51570
BUCHANAN	51027	ISLE OF WIGHT	51093	RAPPAHANNOCK	51157	COVINGTON CITY	51580
BUCKINGHAM	51029	JAMES CITY	51095	RICHMOND	51159	DANVILLE CITY	51590
BUENA VISTA CITY	51530	KING AND QUEEN	51097	ROANOKE	51161	EMPORIA CITY	51595
CAMPBELL	51031	KING GEORGE	51099	ROCKBRIDGE	51163	FAIRFAX CITY	51600

CAROLINE	51033	KING WILLIAM	51101	ROCKINGHAM	51165	FALLS CHURCH CITY	51610
CARROLL	51035	LANCASTER	51103	RUSSELL	51167	FRANKLIN CITY	51620
CHARLES CITY	51036	LEE	51105	SCOTT	51169	FREDERICKSBURG CITY	51630
CHARLOTTE	51037	LOUDOUN	51107	SHENANDOAH	51171	GALAX CITY	51640
CHARLOTTESVILLE CITY	51540	LOUISA	51109	SMYTH	51173	HAMPTON CITY	51650
CHESTERFIELD	51041	LUNENBURG	51111	SOUTHAMPTON	51175	HARRISONBURG CITY	51660
CLARKE	51043	MADISON	51113	SPOTSYLVANIA	51177	HOPEWELL CITY	51670
CRAIG	51045	MATLEWS	51115	STAFFORD	51179	LEXINGTON CITY	51678
CULPEPER	51047	MECKLENBURG	51117	SURRY	51181	LYNCHBURG CITY	51680
CUMBERLAND	51049	POQUOSON CITY	51735	RICHMOND CITY	51760	SUFFOLK CITY	51800
DICKENSON	51051	PORTSMOUTH CITY	51740	ROANOKE CITY	51770	VIRGINIA BEACH CITY	51810
DINWIDDE	51053	RADFORD CITY	51750	SALEM CITY	51775	WAYNESBORO CITY	51820
ESSEX	51057	MANASSAS PARK CITY	51685	SOUTH BOSTON CITY	51780	WILLIAMSBURG CITY	51830
FAIRFAX	51059	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	WAHKIAKUM	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	KITTITAS	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
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	SA1NT 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
DODGE	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	LlNCOLN	56023	SUBLETTE	56035		

APPENDIX C

Part B - U. S. Territories FIPS Codes

Contents

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	KILI	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							
AIMELIIK	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	720SS	MAUNABO	72095	TOA ALTA	72135
BARRANQUITAS	72019	GUAYAMA	72057	MAYAGUEZ	72097	TOA BAIA	72137
BAYAMON	72021	GUAYANILLA	72059	MOCA	72099	TRUJILLO ALTO	72139
CABO ROlO	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 ISLAMD	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 C

PART C – Offshore (Marine Area) FIPS Codes

Offshore (Marine Area)	FIPS Code
Eastern North Pacific Ocean, and along U.S. West Coast from Canadian border to Mexican border	57000
North Pacific Ocean near Alaska, and along Alaska coastline, Including the Bering Sea and the Gulf of Alaska	58000
Central Pacific Ocean, including Hawaiian waters	59000
South Central Pacific Ocean, including American Samoa waters	61000
Western Pacific Ocean, including Mariana Island waters	65000
Western North Atlantic Ocean, and along U.S. East Coast, from Canadian border south to Currituck Beach Light, N.C.	73000
Western North Atlantic Ocean, and along U.S. East Coast, South of Currituck Beach Light, N.C., following the coastline into Gulf of Mexico to Bonita Beach, FL., including the Caribbean Gulf of Mexico, and along the U.S. Gulf Coast from the Mexican77 border to Bonita Beach, FL.	75000
Lake Superior	91000
Lake Michigan	92000
Lake Huron	93000
Lake St. Clair	94000
Lake Erie	96000
Lake Ontario	97000
St. Lawrence River above St Regis	98000

APPENDIX D
MENU LISTINGS

10. Password Help

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

20. Encoder Operation Help

201, Not Available
202. Not Available
203. Not Available
204. Not Available
205. Not Available
206. Not Available
207. Not Available
208. Not Available
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

40. Audio/Printer Operation Help

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

Setup Menu

1. Set Station Time Zone
2. Set Current Date/Time
3. Daylight Saving?
4. Not Available
5. Set Station FIPS Code
6. Set Station Indentification Code
7. Not Available
8. Change Primary Password
9. Change Setup Password
10. Select Events To Auto Forward
11. Add Locations To Auto Foward
12. Verify Or Delete Locations To Auto Forward

13,14, Not Available

15. Not Available
16. Voice Recorder Installed?
17. Not Available
18. Enable Char Gen Interface
19. Not Available
20. Set LCD Contrast
21. Record Voice Announcement
22. Verify Voice Announcement
23. Not Available
24. Not Available
25. Set Alert Timeout
26. Set One-Button Manual Forward
27. Enable C.G. Text for RWT
28. Set Auto Mode Timer

29,30. Not Available

31,32. Not Available

50. Encoder Setup Help

501. To Set Current Date/Time
502. To Set Station Time Zone
503. Daylight Saving?
504. Not Available
505. To Set Station FIPS Code
506. To Set Station Identification Code
507. To Set Attention Signal Duration
508. Not Available
509. Not Available
510. Not Available

60. Decoder Setup Help

601. To Select Events to Auto Forward
602. To Add Locations to Auto Forward
603. To Verify or Delete Locations to Auto Forward

70. Accessory Setup Help

701. To Enable Character Generator Interface
702. Voice Recorder Status
703. Not Available
704. Record Voice Announcement
705. To Verify Voice Announcement
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

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
7. Set Printer Operation
8. Set Message Hold

APPENDIX E

EAS DECODER TO VIDEO CHARACTER GENERATOR INTERFACE

1. Introduction

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

2. General Sequence and Comments

The protocol between the CG and EAS 911D is a hand-shaking sequence of codes for the CG and EAS 911D 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 911D 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 911D	EAS 911D Data Out to CG	EAS 911D Audio Out to CG	On-Air Relay Status	Remarks
To inform the CG that the EAS 911D 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 911D	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)

Purpose	Step	CG Data Out to EAS 911D	EAS 911D Data Out to CG	EAS 911D Audio Out to CG	On-Air Relay Status	Remarks
To request the last text message from EAS 911D	6A	STX + Control-5 + ETX				B
	6B		STX + Control-5 + Text + ETX		Closed	
To request only the last alert voice message stored in EAS 911D	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
To request only the EOM audio	9A	STX + Control-9 + ETX				D
	9B			EOM	Closed	
	9C		STX + Control-9 + ETX			
To inhibit opening of the On-Air Relay	10	STX + Control-A + ETX				E
To open the On-Air Relay	11A	STX + Control-B + ETX				F
	11B				Open	
To close the On-Air Relay	12A	STX + Control-C + ETX				G
	12B				Closed	
Request EAS Audio Header	13A	STX + Hex 0x16 + ETX				J, K
	13B			Audio Header	Closed	
	13C		STX + Hex 0x16 + ETX			
Request Attention Signal	14A	STX + Hex 0x17 + ETX				J, K
	14B			Attention Signal	Closed	
	14C		STX + Hex 0x17 + ETX			
Request Voice Announcement	15A	STX + Hex 0x18 + ETX				J, K
	15B			Voice Announcement	Closed	
	15C		STX + Hex 0x18 + ETX			
Request Alert Voice Message	16A	STX + Hex 0x19 + ETX				J, K
	16B			Alert Voice Message		
	16C		STX + Hex 0x19 + ETX			

3. Protocol Table (Continued)

Purpose	Step	CG Data Out to EAS 911D	EAS 911D Data Out to CG	EAS 911D Audio Out to CG	On-Air Relay Status	Remarks
Request EOM	17A	STX + Hex 0x1B + ETX				J, K
	17B			EOM	Closed	
	17C		STX + Hex 0x1B + ETX			
Request EAS Header	18A	STX + Hex 0x1C + ETX				L
	18B		STX + Hex 0x1C + ETX			
Request EAS Translation	19A	STX + Hex 0x21 + ETX				K
	19B		STX + Hex 0x21 + ETX			
EAS 943 Sends Live Audio Patch	20A	STX + Hex 0x2B + ETX				M
	20B			Live Audio Patch	Closed	
EAS 943 Ends Live Audio Patch	21A	STX + Hex 0x5A + ETX				M
	21B				Open	

3.1 Remarks

A. The EAS 911D 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 911D 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 911D 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 911D transmit an exception code (Step 8) and abort message transmission.

D. The EAS 911D will not interact with the CG when in Practice Mode.

E. This command is intended to allow the On-Air relay to remain closed after each segment of the audio transmission, until the Open On-Air Relay command is received. When decoded, it initiates a 45-second timer. The Open On-Air Relay command will cause the On-Air relay to open as soon as the 45-second timer has expired.

F. This command is intended to be used in conjunction with the Inhibit Opening Relay command. It should normally be issued after all audio transmissions have been completed. The relay will open as soon as the 45-second timer initiated with the Inhibit Opening Relay command has expired.

G. This command allows the used to close the On-Air relay independent of any EAS 911D activity. Once closed, the relay will remain closed until another command or transmission causes it to open.

H. (Purposely omitted)

I. All “Request Audio” commands 13-17 above) will be acknowledged by the EAS 911D when the audio is completed by sending the same command sequence to the I/F.

J. The EAS 911D response to commands 13 to 17 and 19 above is identical to the original protocol, except that 13, 14 and 15 are now subsets of the original commands for continuous audio sequences. In addition, the acknowledge sequences reflect the new hex command values.

K. The EAS 911D response to command 18 above is identical to the original protocol output of the header to the I/F, except wit the new command byte inserted, i.e.:

STX + Hex0x1C + EAS Header + ETX.

L. Commands 20 and 21 above are available only when enabled via ALTERNATE I/F A and when the EAS 911D is connected to an EAS 943 Telephone Access Unit.

4.0 Mode of Operation

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

4.1 When the EAS 911D is operated in Auto Mode and a non-priority message is being automatically forwarded:

a. EAS 911D informs CG that it has a message to transmit (Step 1).
b. CG requests header translation (Step 3A).
c. The EAS 911D transmits the header translation (Step 3B).
d. The CG requests the audio header and attention signal (Step 4A).
e. The EAS 911D transmits audio (Step 4B) followed by data acknowledge (Step 4C).
f. CG requests alert voice message and audio EOM (Step 5A).
g. The EAS 911D transmits alert voice and audio EOM (Step 5B) followed by data acknowledge (Step 5C).

4.2 When the EAS 911D 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 911D front panel.
b. The EAS 911D informs the CG that it has a message to transmit (Step 1).
c. CG requests header translation (Step 3A).
d. The EAS 911D transmits the header translation (Step 3B).
e. The CG requests the audio header and attention signal (Step 4A).
f. The EAS 911D transmits audio (Step 4B) followed by data acknowledge (Step 4C).
g. CG requests alert voice message and EOM (Step 5A).
h. The EAS 911D 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 911D front panel.
j. The EAS 911D transmits audio EOM (Step 5B*) followed by data acknowledge (Step 5C).

4.3 When the EAS 911D is transmitting an encoded message:

Steps a - g are the same as for a manually forwarded message, described in 4.2.

h. The EAS 911D 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 911D is auto forwarding a priority message (event code is "EAN" or "EAT"):

a. EAS 911D 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 911D 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 911D 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 911D 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 911D 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 911D.

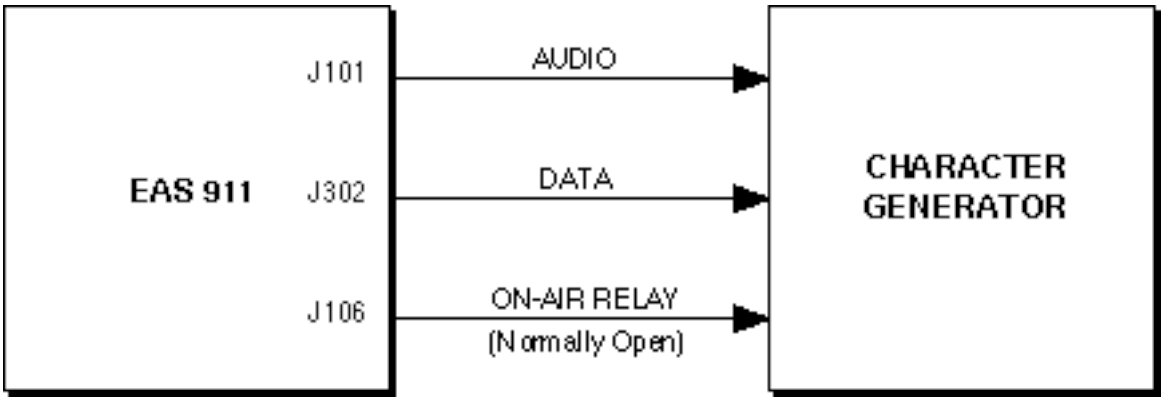


Figure C-1. System Interconnect Diagram

APPENDIX F

ORIGINATOR AND EVENT CODE TRANSLATIONS

Originator codes:

ORG	English Translation
EAS	A Broadcast Station or Cable System
EAN	A National Emergency Action Notification Network
CIV	A Civil Authority
WXR	The National Weather Service
PEP	A Primary Entry Point

Event Code	English Translation	Event Code	English Translation
EAN	A National Emergency Action Notification	HWW	A High Wind Warning
EAT	A National Emergency Action Termination	HUA	A Hurricane Watch
NIC	A National Information Center Message	HUW	A Hurricane Warning
NPT	A National Periodic Test	HLS	A Hurricane Statement
RMT	A Required Monthly Test	LEW	A Law Enforcement Warning
RWT	A Required Weekly Test	LAE	A Local Area Emergency
ADR	An Administrative Message	NMN	A Network Message Notification
AVA	An Avalanche Watch	TOE	A 911 Telephone Outage Emergency
AVW	An Avalanche Warning	NUW	A Nuclear Power Plant Warning
BZW	A Blizzard Warning	DMO	A Practice/Demo Warning
CAE	A Child Abduction Emergency	RHW	A Radiological Hazard Warning
CDW	A Civil Danger Warning	SVR	A Severe Weather Warning
CEM	A Civil Emergency Message	SVA	A Severe Thunderstorm Watch
CFA	A Coastal Flood Watch	SVS	A Severe Weather Statement
CFW	A Coastal Flood Warning	SPW	A Shelter in Place Warning
DSW	A Dust Storm Warning	SMW	A Special Marine Warning
EQW	An Earthquake Warning	SPS	A Special Weather Statement
EVI	An Immediate Evacuation Notice	TOA	A Tornado Watch
FRW	A Fire Warning	TOR	A Tornado Warning
FFA	A Flash Flood Watch	TRA	A Tropical Storm Watch
FFW	A Flash Flood Warning	TRW	A Tropical Storm Warning
FFS	A Flash Flood Statement	TSA	A Tsunami Watch
FLA	A Flood Watch	TSW	A Tsunami Warning
FLW	A Flood Warning	VOW	A Tsunami Warning
FLS	A Flood Statement	WSA	A Winter Storm Watch
HMW	A Hazardous Materials Warning	WSW	A Winter Storm Warning
HWA	A High Wind Watch		

APPENDIX G

GLOSSARY OF EAS DECODER TERMS

TERM	EXPLANATION
Attention Signal	The 853 and 960 Hz tone formerly used by the EBS
Auto Forward	The act of automatically retransmitting or relaying an EAS message without operator intervention whenever the EAS DECODER is set to Auto Mode and the EVENT and FIPS codes of a received message match those Events and FIPS codes set by the setup menu for Auto Forwarding.
Banner Mode	The normal, standby condition of the EAS DECODER in which the date and time are displayed in the LCD screen.
COM port	Communications Port, or connector, on the rear panel of the EAS DECODER, which connects and enables various extenal devices
Duration	The valid time period of an EAS event, e.g. "A tornado watch for the next 3 hours." In this case, "3 hours" is the duration.
EAS	Emergency Alert System or the originator field code for a broadcast station or cable system in an EAS message
EOM	End-of-Message; the FSK signal ("nnnn") sent at the end of an EAS message
FIPS	Federal Information Processing Identifier, a unique five-digit number for every county, parish, borough, or census district in the US and its possessions
Header	The fields of the EAS protocol: sync, ORG, EVENT, LOCATION (FIPSs), Duration, Date/Time Stamp, and Station ID; the FSK signal that consists of the header
LCD	Liquid Crystal Display
Mode	The state of operation of the EAS DECODER, i.e. Manual or Automatic
NOAA Commerce	National Oceanagraphic and Atmospheric Administration, a branch of the Department
ORG	Originator, field in an EAS message, e.g. WXR-National Weather Service, CIV-Civil Authority
Password	The 3-digit number that must be entered after pressing the "PASSWORD" key to gain operator or setup access to the EAS DECODER
PCB	Printed Circuit Board
Primary Password	The 3-digit code used by the station operator.
Ready Mode	(same as Banner Mode)
Setup Password	The 3-digit code used by the station owner/manager/engineer to setup and change the basic operation of the EAS DECODER
Station ID	The call sign of the broadcast station at which this EAS DECODER is located, e.g. "KTFT/AM"; the cable system identifier, e.g. "CA0233 ").
Subdivision	One-ninth parts of a county, parish, borough, or census district or US possession
SAME	Specific Area Message Encoding