*TECHNICAL MANUAL*
*888-2509-002*

*ACC+*
*Adaptive Carrier Control Plus*

# *ACC+*
# *Adaptive Carrier Control Plus*

HARRIS

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# *Manual Revision History*

## *ACC+ Adaptive Carrier Control Technical Manual*

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| A | | | Release Rev. A |
| B | | | Update |
| D | 8/2011 | xxxx | Updated entire manual |



**WARNING: Disconnect primary power prior to servicing.**

## Technical Assistance

Technical and troubleshooting assistance for HARRIS Transmission products is available from HARRIS Field Service (factory location: Quincy Illinois USA) during normal business hours (8:00 AM - 5:00 PM Central Time). Telephone ***+1-217-222-8200*** to contact the Field Service Department; FAX ***+1-217-221-7086***; or E-mail questions to ***tsupport@harris.com.***
**Emergency service is available 24 hours a day seven days a week *by telephone only.***
Online assistance including technical manuals white papers software downloads and service bulletins are available at ***http://www.broadcast.harris.com*** (from there click on ***Customer Support Portal*** under the ***Services & Support*** tab dropdown menu).
Address written correspondence to Field Service Department HARRIS Broadcast Communications Division P.O. Box 4290 Quincy Illinois 62305-4290 USA. For other global service contact information please visit: ***http://www.broadcast.harris.com/contact.***
**NOTE:** For all service and parts correspondence you will need to provide the Sales Order number as well as the Serial Number for the transmitter or part in question. For future reference record those numbers here: _____/_____
Please provide these numbers for any written request or have these numbers ready in the event you choose to call regarding any Service or Parts requests. For warranty claims it will be required and for out of warranty products this will help us to best identify what specific hardware was shipped.

## Replaceable Parts Service

Replacement parts are available from HARRIS Service Parts Department 7:00 AM to 7:00 PM Central Time Monday through Friday and 8:00 AM to 1:00 PM Central Time on Saturday. Telephone ***+1-217-222-8200*** or email ***servicepartsreq@harris.com*** to contact the Service Parts Dept.
**Emergency replacement parts are available *by telephone only*** 24 hours a day seven days a week by calling ***+1-217-222-8200.***

## Unpacking

Carefully unpack the equipment and perform a visual inspection to determine if any apparent damage was incurred during shipment. Retain the shipping materials until it has been verified that all equipment has been received undamaged. Locate and retain all PACKING CHECK LISTs. Use the PACKING CHECK LIST to help locate and identify any components or assemblies which are removed for shipping and must be reinstalled. Also remove any shipping supports straps and packing materials prior to initial turn on.

## Returns And Exchanges

No equipment can be returned unless written approval and a Return Authorization is received from HARRIS Broadcast Communications Division. Special shipping instructions and coding will be provided to assure proper handling. Complete details regarding circumstances and reasons for return are to be included in the request for return. Custom equipment or special order equipment is not returnable. In those instances where return or exchange of equipment is at the request of the customer or convenience of the customer a restocking fee will be charged. All returns will be sent freight prepaid and properly insured by the customer. When communicating with HARRIS Broadcast Communications Division specify the HARRIS Order Number or Invoice Number.

**WARNING:**
*THE CURRENTS AND VOLTAGES IN THIS EQUIPMENT ARE DANGEROUS. PERSONNEL MUST AT ALL TIMES OBSERVE SAFETY WARNINGS INSTRUCTIONS AND REGULATIONS.*

This manual is intended as a general guide for trained and qualified personnel who are aware of the dangers inherent in handling potentially hazardous electrical/electronic circuits. It is not intended to contain a complete statement of all safety precautions which should be observed by personnel in using this or other electronic equipment.

The installation operation maintenance and service of this equipment involves risks both to personnel and equipment and must be performed only by qualified personnel exercising due care. HARRIS CORPORATION shall not be responsible for injury or damage resulting from improper procedures or from the use of improperly trained or inexperienced personnel performing such tasks. During installation and operation of this equipment local building codes and fire protection standards must be observed.

The following National Fire Protection Association (NFPA) standards are recommended as reference:

- Automatic Fire Detectors No. 72E
- Installation Maintenance and Use of Portable Fire Extinguishers No. 10
- Halogenated Fire Extinguishing Agent Systems No. 12A

**WARNING:**
*ALWAYS DISCONNECT POWER BEFORE OPENING COVERS DOORS ENCLOSURES GATES PANELS OR SHIELDS. ALWAYS USE GROUNDING STICKS AND SHORT OUT HIGH VOLTAGE POINTS BEFORE SERVICING. NEVER MAKE INTERNAL ADJUSTMENTS PERFORM MAINTENANCE OR SERVICE WHEN ALONE OR WHEN FATIGUED.*

Do not remove short-circuit or tamper with interlock switches on access covers doors enclosures gates panels or shields. Keep away from live circuits know your equipment and don't take chances.

**WARNING:**
*IN CASE OF EMERGENCY ENSURE THAT POWER HAS BEEN DISCONNECTED.*

**WARNING:**
*IF OIL FILLED OR ELECTROLYTIC CAPACITORS ARE UTILIZED IN YOUR EQUIPMENT AND IF A LEAK OR BULGE IS APPARENT ON THE CAPACITOR CASE WHEN THE UNIT IS OPENED FOR SERVICE OR MAINTENANCE ALLOW THE UNIT TO COOL DOWN BEFORE ATTEMPTING TO REMOVE THE DEFECTIVE CAPACITOR. DO NOT ATTEMPT TO SERVICE A DEFECTIVE CAPACITOR WHILE IT IS HOT DUE TO THE POSSIBILITY OF A CASE RUPTURE AND SUBSEQUENT INJURY.*

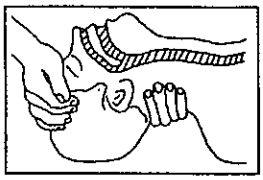
## TREATMENT OF ELECTRICAL SHOCK

1. IF VICTIM IS NOT RESPONSIVE FOLLOW THE A-B-CS OF BASIC LIFE SUPPORT.

PLACE VICTIM FLAT ON HIS BACK ON A HARD SURFACE

### (A) AIRWAY

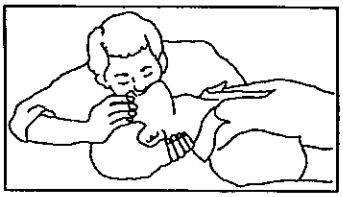
IF UNCONSCIOUS.
OPEN AIRWAY



LIFT UP NECK
PUSH FOREHEAD BACK
CLEAR OUT MOUTH IF NECESSARY
OBSERVE FOR BREATHING

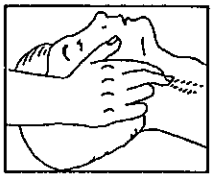
### (B) BREATHING

IF NOT BREATHING.
BEGIN ARTIFICIAL BREATHING



TILT HEAD
PINCH NOSTRILS
MAKE AIRTIGHT SEAL
4 QUICK FULL BREATHS
REMEMBER MOUTH TO MOUTH RESUSCITATION MUST BE COMMENCED AS SOON AS POSSIBLE

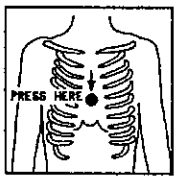
CHECK
CAROTID PULSE



IF PULSE ABSENT.
BEGIN ARTIFICIAL CIRCULATION

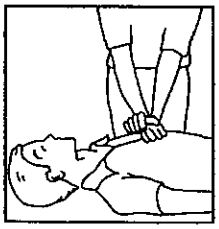
### (C) CIRCULATION

DEPRESS STERNUM 1 1/2 TO 2 INCHES




APPROX. RATE OF COMPRESSIONS --80 PER MINUTE
- ONE RESCUER
- 15 COMPRESSIONS
- 2 QUICK BREATHS

APPROX. RATE OF COMPRESSIONS --60 PER MINUTE
- TWO RESCUERS
- 5 COMPRESSIONS
- 1 BREATH



NOTE: DO NOT INTERRUPT RHYTHM OF COMPRESSIONS WHEN SECOND PERSON IS GIVING BREATH

CALL FOR MEDICAL ASSISTANCE AS SOON AS POSSIBLE.

2. IF VICTIM IS RESPONSIVE.

A. KEEP THEM WARM
B. KEEP THEM AS QUIET AS POSSIBLE
C. LOOSEN THEIR CLOTHING
D. A RECLINING POSITION IS RECOMMENDED


**WARNING: Disconnect primary power prior to servicing.**

# FIRST-AID

Personnel engaged in the installation operation maintenance or servicing of this equipment are urged to become familiar with first-aid theory and practices. The following information is not intended to be complete first-aid procedures it is a brief and is only to be used as a reference. It is the duty of all personnel using the equipment to be prepared to give adequate Emergency First Aid and there by prevent avoidable loss of life.

Treatment of Electrical Burns

1. Extensive burned and broken skin
    a. Cover area with clean sheet or cloth. (Cleanest available cloth article.)
    b. Do not break blisters remove tissue remove adhered particles of clothing or apply any salve or ointment.
    c. Treat victim for shock as required.
    d. Arrange transportation to a hospital as quickly as possible.
    e. If arms or legs are affected keep them elevated.

**NOTE:**
If medical help will not be available within an hour and the victim is conscious and not vomiting give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold). Allow victim to sip slowly about 4 ounces (a half of glass) over a period of 15 minutes. Discontinue fluid if vomiting occurs. (Do not give alcohol.)

2. Less severe burns - (1st & 2nd degree)
    a. Apply cool (not ice cold) compresses using the cleanest available cloth article.
    b. Do not break blisters remove tissue remove adhered particles of clothing or apply salve or ointment.
    c. Apply clean dry dressing if necessary.
    d. Treat victim for shock as required.
    e. Arrange transportation to a hospital as quickly as possible.
    f. If arms or legs are affected keep them elevated.

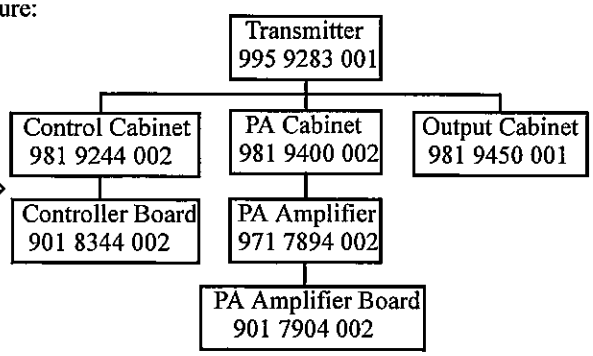
REFERENCE:
ILLINOIS HEART ASSOCIATION
AMERICAN RED CROSS STANDARD FIRST AID AND PERSONAL SAFETY MANUAL (SECOND EDITION)

# Guide to Using Harris Parts List Information

The Harris Replaceable Parts List Index portrays a tree structure with the major items being leftmost in the index. The example below shows the Transmitter as the highest item in the tree structure. If you were to look at the bill of materials table for the Transmitter you would find the Control Cabinet the PA Cabinet and the Output Cabinet. In the Replaceable Parts List Index the Control Cabinet PA Cabinet and Output Cabinet show up one indentation level below the Transmitter and implies that they are used *in* the Transmitter. The Controller Board is indented one level below the Control Cabinet so it will show up in the bill of material for the Control Cabinet. The tree structure of this same index is shown to the right of the table and shows indentation level versus tree structure level.

Example of Replaceable Parts List Index and equivalent tree structure:

| Replaceable Parts List Index | Part Number | Page |
|---|---|---|
| Table 7-1. Transmitter | 995 9283 001 | 7-2 |
| Table 7-2. Control Cabinet | 981 9244 002 | 7-3 |
| Table 7-3. Controller Board | 901 8344 002 | 7-6 |
| Table 7-4. PA Cabinet | 981 9400 002 | 7-7 |
| Table 7-5. PA Amplifier | 971 7894 002 | 7-9 |
| Table 7-6. PA Amplifier Board | 901 7904 002 | 7-10 |
| Table 7-7. Output Cabinet | 981 9450 001 | 7-12 |




The part number of the item is shown to the right of the description as is the page in the manual where the bill for that part number starts. Each table headings is in the format of; **Table #-#. ITEM NAME - HARRIS PART NUMBER** - this line gives the information that corresponds to the Replaceable Parts List Index entry;

Inside the actual tables four main headings are used:

- **HARRIS P/N** column gives the Harris part number (usually in ascending order);
- **DESCRIPTION** column gives a 25 character or less description of the part number;
- **Qty UM** column notes the quantity and unit of measure of the item;
- **REF. SYMBOLS/EXPLANATIONS** column 1) gives the reference designators for the item (i.e. C001 R102 etc.) that corresponds to the number found in the schematics (C001 in a bill of material is equivalent to C1 on the schematic) or 2) gives added information or further explanation (i.e. "Used for 208V operation only " or "Used for HT 10LS only " etc.).

**NOTE: Inside the individual tables some standard conventions are used:**

- A # symbol in front of a component such as #C001 under the REF. SYMBOLS/EXPLANATIONS column means that this item is used on or with C001 and is not the actual part number for C001.
- In the ten digit part numbers if the last three numbers are 000 the item is a part that Harris has purchased and has not manufactured or modified. If the last three numbers are other than 000 the item is either manufactured by Harris or is purchased from a vendor and modified for use in the Harris product.
- The first three digits of the ten DIGIT part number tell which family the part number belongs to - for example all electrolytic (can) capacitors will be in the same family (524 xxxx 000). If an electrolytic (can) capacitor is found to have a 9xx xxxx xxx part number (a number outside of the normal family of numbers) it has probably been modified in some manner at the Harris factory and will therefore show up farther down into the individual parts list (because each table is normally sorted in ascending order). Most Harris made or modified assemblies will have 9xx xxxx xxx numbers associated with them.

The term "SEE HIGHER LEVEL BILL" in the description column implies that the reference designated part number will show up in a bill that is higher in the tree structure. This is often the case for components that may be frequency determinant or voltage determinant and are called out in a higher level bill structure that is more customer dependent than the bill at a lower level.



**WARNING: Disconnect primary power prior to servicing.**

HARRIS Broadcast Communications Division
P.O. Box 4290, QUINCY, IL 62305

# PARTS ORDER FORM

HARRIS PHONE: 217-222-8200
HARRIS FAX: 217-221-7096

BILLING INFORMATION

CUSTOMER NAME: _____

ADDRESS: _____

_____

_____

_____

TELEPHONE NUMBER: _____

FAX NUMBER: _____

PREFERRED PAYMENT METHOD: _____

SHIPPING INFORMATION
(if different from billing information)

SHIP TO: _____

ADDRESS: _____

_____

_____

_____

TELEPHONE NUMBER: _____

FAX NUMBER: _____

SHIPPING METHOD PREFERRED: _____

FREQUENCY (If required): _____

EQUIPMENT NAME: _____

EQUIPMENT PART NUMBER: _____

EQUIPMENT SERIAL NUMBER: _____

GUIDE FOR ORDERING PARTS

- Please use the following parts order form, filling in as much information as possible. The complete informaiton will allow double checking the part number for correctness or locating a substitude if the part is not available.
- The equipment name, part number, and serial number will be found on a metal ID plate on the back of the unit. The serial number MUST be included for any warranty parts.
- Describe the part using the description in the parts list if possible. Include the schematic information, schematic number, or number of next higher assembly. The next higher assembly is usually a 981-xxxx-yyy type.

| ITEM # | QTY | HARRIS PART NUMBER | DESCRIPTION OF PART (PART NAME, DESCRIPTION, SPECIFICATION FROM PARTS LIST IF AVAILABLE) | SCHEMATIC REFERENCE REFERENCE NAME (e.g. C001, R100, etc) | ITEM USED ON (NEXT HIGHER ASSEMBLY IF KNOWN) (e.g. C001 used on 992 8025 001, SCHEMATIC 839 8099 991) | COMMENTS |
|---|---|---|---|---|---|---|
| | | | | | | |
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# Section 1 Introduction

1

## 1.1 Scope And Purpose

This technical manual contains the information necessary to install and maintain the ACC+ Adaptive Carrier Control. The manual is conveniently divided into the following sections:

- SECTION I INTRODUCTION/SPECIFICATIONS. Provides general manual layout equipment description, block diagrams, description and specifications.
- SECTION II INSTALLATION/INITIAL TURN-ON. Provides detailed installation procedures and initial turn on instructions.
- SECTION III OPERATORS GUIDE. Provides a description of the normal operation of the unit using controls and indicators.
- SECTION IV OVERALL SYSTEM THEORY. Provides block diagram and detailed theory of operation of the controller unit and various sections that apply to the overall system.
- SECTION V MAINTENANCE/ALIGNMENTS. Provides board alignment procedures.
- SECTION VI TROUBLESHOOTING. Provides general information for troubleshooting.
- SECTION VII PARTS LIST. Provides a parts list for the entire assembly.

## 1.2 Equipment Description

The following technical manual is intended to familiarize the reader with the Harris Adaptive Carrier Control (ACC+) system for Digital Amplitude Modulation (DX) transmitters. Even though DX transmitters are already highly efficient (overall 83% or better), ACC+ may be used to further reduce operating costs. ACC+ may also be referred to as Dynamic Carrier Control or Dynamic Amplitude Modulation.



**WARNING: Disconnect primary power prior to servicing.**

ACC+ may already be installed in the transmitter or be delivered as a field upgrade kit.

## 1.2.1 ACC+ Concept

The ACC+ concept is very simple. ACC+ allows the carrier of the transmitter to be reduced during segments of low audio amplitude input, or no audio input, resulting in power savings. For example, if a transmitter is modulated 100% then the carrier is fully utilized. Without ACC+ if the audio input is reduced and modulation is only 50%, then carrier power is wasted. In theory, ACC+ would reduce the carrier power until 95% modulation (for example) is again attained. If the audio input is increased, ACC+ would increase the carrier power high enough to prevent negative clipping and attain 95% modulation. Therefore, ACC+ is a form of carrier control that is dependent upon the audio input level and designed to reduce operating costs.

### 1.2.1.1 Graphical Representation

Refer to the graph (fig. 1-1) in this section.

a. The horizontal axis displays Audio Input (in dBm) with respect to 100% modulation. On the extreme right side of the scale 0dBm = the audio input level that creates 100% modulation. Typically this level is +10dBm.

b. The vertical axis displays Carrier Level (in dB) with respect to normal carrier. On the extreme top side of the scale full carrier = 0dB.

c. For a normal DX transmitter the operation would be described by a single straight line at the top of the chart. The top right hand side equals 100% modulation at full carrier level.

d. The other set of lines on this graph represent the set of programmable ACC+ curves that are user selectable.

The amount of carrier reduction is controllable from -1 to -6 dB, in 1 dB steps corresponding with the set of horizontal lines in the center of the graph.

The point at which ACC+ starts is also selectable in terms of 95%, 90%, 85%, and 80% modulation. This corresponds with the set of upwards-sloping lines at the right-hand side of the graph.

The circuit is configurable to select only one of the flat horizontal lines and one of the upward-sloping lines. All other lines are ignored. These lines are merged to form a piecewise-linear function. The carrier level versus audio level is then described by this single function. The user can program a different ACC+ function which replaces one segment of the ACC+ function with one at a higher or lower level.

### 1.2.1.2 ACC+ Curve Example

For purposes of discussion, assume that the ACC+ function curve desired is the one on the graph that corresponds to 95% modulation and -6dB carrier power reduction. We will also assume that the transmitter is adjusted such that +10dBm audio input will create 100% transmitter modulation.

a. When +10dBm audio is applied to the transmitter, the ACC+ system is at the top right side of the graph. Carrier power is at full power, the audio input level is at +10dBm, and the transmitter is modulated 100%.

b. When the audio input level is reduced to -0.5dBm, carrier power is still 100% and transmitter modulation has dropped to 95% modulation.

c. When the audio input level is reduced to -2dBm, carrier power is reduced approximately -1.6dB, and transmitter modulation is maintained at 95% modulation.

d. When the audio input level is reduced to -6dBm, carrier power is reduced approximately -5.5dB, and transmitter modulation is maintained at 95% modulation.

e. When the audio input level is reduced to -7dBm, carrier power is reduced approximately -6dB, and transmitter modulation is reduced to 92% modulation.

f. When the audio input level is reduced to -10dBm, carrier power remains reduced -6dB, and transmitter modulation is reduced to 64% modulation.

g. Finally, when audio input is turned off, carrier power remains reduced -6dB and transmitter modulation is 0%.

See the curve graph below to determine the ACC+ output based on any of the other curves (80%, 85%, 90% or -1dB, -2dB, -3dB, -4dB, -5dB) selected.

**NOTE:**
Curves are selected by switch S1. See "2.5.1 Select ACC+ Curve (S1)" on page 2-7.

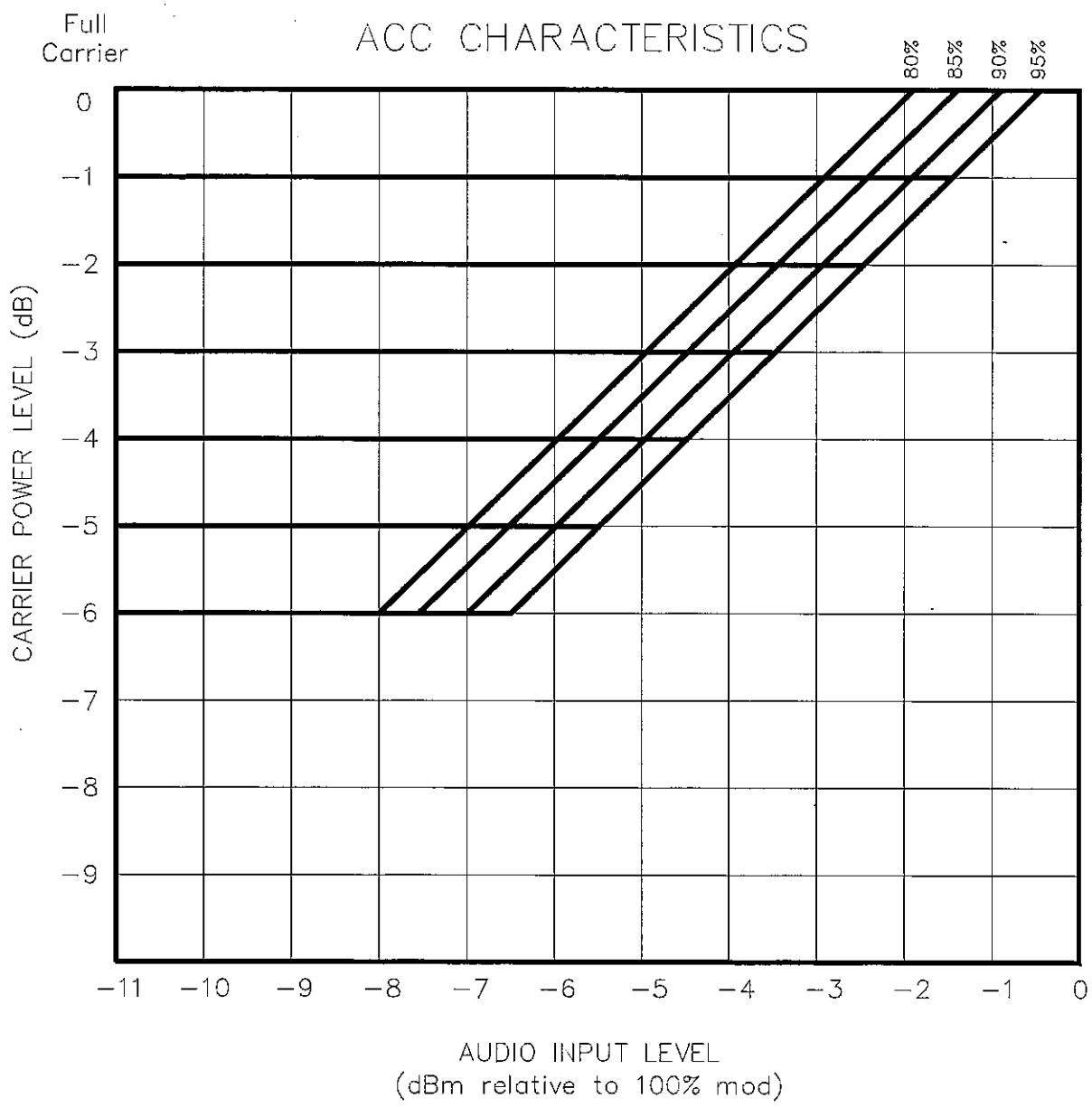



**Figure 1-1**
**ACC+ Characteristics Curve Graph**

### 1.2.1.3 Power Savings

Due to the highly dynamic nature of typical programming, it is difficult to predict actual power savings. However, some stations have performed ACC+ tests on transmitters and

reported as much as a 35% savings in power consumption over a non-ACC+ transmitter with no perceptible difference in audio quality or reception range.

The 95% and -6dB curve provides the most power savings, while the 80% and -1dB curve provides the least power savings.

#### 1.2.1.4 Conclusion

ACC+ represents improved ways to reduce energy consumption and reduce operating cost. It can be used with our already highly efficient DX transmitters without effecting listener pleasure or disturbing coverage area.

## 1.3 Block Diagram

The ACC+ system is contained on a PC board that is mounted inside the transmitter. Program audio is applied to the ACC+ board and then connected to the transmitter audio input. A carrier sample from the oscillator board is required for synchronization of the system. The power supplied required by the ACC+ circuit board is supplied by the transmitters internal low voltage power supplies.

## 1.4 Specifications

The following is a listing of the specifications for this unit.

### 1.4.1 Selectable Curves

24 curves in -1, -2, -3, -4, -5, or -6 dB carrier reduction steps at 80, 85, 90, or 95% modulation.

**NOTE:**
Curves are selected by switch S1. See "2.5.1 Select ACC+ Curve (S1)" on page 2-7.

### 1.4.2 Reduction Accuracy

Accuracy: +/-0.5dB carrier reduction accuracy when properly aligned.

### 1.4.3 Squarewave Overshoot

With ACC+ enabled, 3% maximum.

### 1.4.4 ACC+ Operation

ACC+ On/Off selectable by local toggle switch or by ground sink remote control.

### 1.4.5 Audio Input Level

Normally +10 dBm for 100% modulation.

### 1.4.6 Audio Input Impedance

Balanced input with selectable 600 ohm or high impedance.

### 1.4.7 Audio Input Connector

Terminal strip TB1.

**NOTE:**
Specifications subject to change without notice.

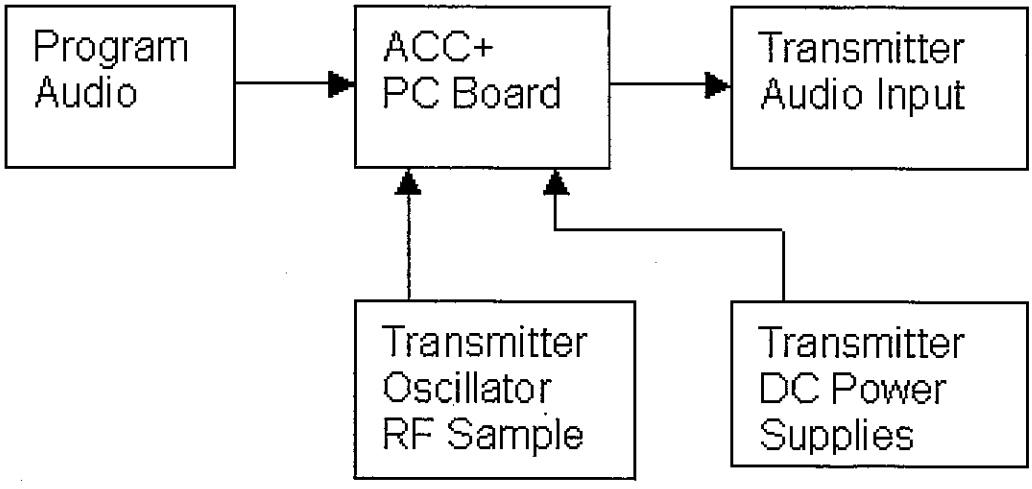



**Figure 1-2**
**Simple Block Diagram of the ACC+ System**

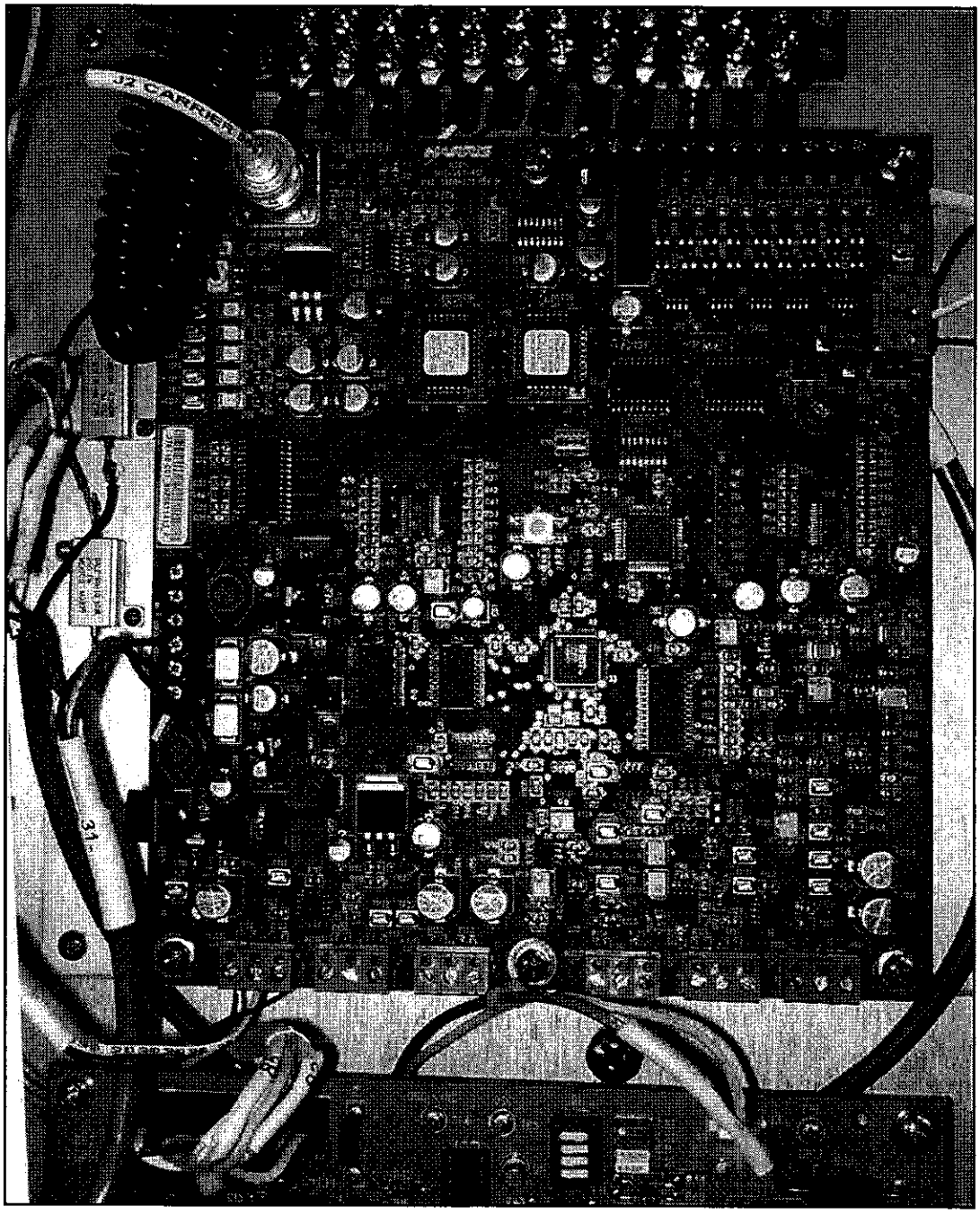


**Figure 1-3**
**ACC+ Board Installed in DX-10**


**WARNING: Disconnect primary power prior to servicing.**

# Section 2 Installation

2

## 2.1 Introduction

This section provides information and instructions necessary for the installation and initial turn-on of the ACC+ Adaptive Carrier Control board in a DX-10, DX-15, DX-25U, and DX-50.

## 2.2 Returns And Exchanges

Damaged or undamaged equipment should not be returned unless a written Return Authorization is issued. When communicating with Harris Corporation, Broadcast Division, specify the order number or invoice number. Include complete details regarding circumstances and reasons for return in the request. Custom equipment or special order equipment is not returnable. In instances where return or exchange of equipment is at the request or convenience of the customer, a restocking fee will be charged. Special shipping instructions and coding will be provided to insure proper handling. All returns will be sent freight prepaid and properly insured by the customer.

## 2.3 Unpacking

If ACC+ is not already installed in the transmitter, carefully unpack the unit and save all packing material. Inspect thoroughly for any damage incurred in shipment. Retain all PACKING CHECK LISTS (if provided) to locate and identify any components or assemblies removed for shipping.

# 2.4 Installation

This section provides the information necessary to install and verify performance of the ACC+ Adaptive Carrier Control in a DX-10, DX-15, DX-25U, or DX-50 transmitter.

**NOTE:**
See "Figure 3-1 Component Locator" on page 3-3. See Table 6-1 on page 6-2 for a listing of testpoints jumpers LEDs and potentiometers.

The Harris part number of the ACC+ Installation Kit for the DX transmitter is 992-9764-371. The ACC+ installation kit contains:

a. ACC+ PC board
b. Mounting plate with mounting hardware and terminal strip
c. Audio cables and lugs
d. DC power cable
e. RF sync cable
f. (2) 25Ω 10W resistors
g. Adjustment tools
h. ACC+ Audio Connection **(Interconnect)** drawing #843-5523-792 Rev G or later

## 2.4.1 Test Equipment Needed for Installation

The following test equipment is needed to install the ACC+ circuit and verify its performance:

a. Audio generator
b. Oscilloscope or modulation monitor
c. Spectrum analyzer (optional)

## 2.4.2 Transmitter Configuration and Alignment

**NOTE:**
Refer to the Transmitter's Technical Manual and Drawing Package for the following procedure.

a. On the Analog Input board, ensure wire 100 is going to J1 for 600 Ω audio input impedance.

b. Turn the transmitter ON at HIGH power and make the following adjustments:

1. Raise HIGH power level to the desired power level.
2. Switch to MEDIUM power and raise power level to the desired power level.
3. Switch to LOW power and raise power level to the desired power level.

c. Apply audio at +10 dBm and adjust R15 Audio Gain potentiometer on the **Analog Input** board for 100% modulation.

d. *Turn the transmitter OFF and* ***turn off the low voltage AC circuit breakers CB1 and CB2.***

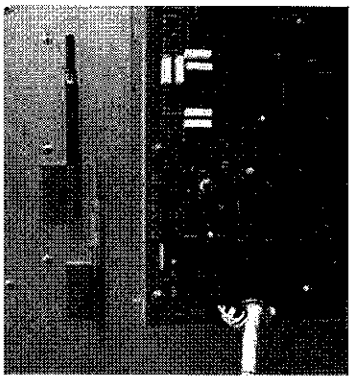
## 2.4.3 Mechanical Installation and Audio Connections

**NOTE:**
You may have to reposition the tool holders originally located just above the Oscillator board.

a. Carefully remove the plastic tool holder.

b. Remove any remaining adhesive.

c. Place the supplied plastic tool holders as shown in picture to the right (This is showing the LED board on the inside of the center PA cabinet door of a DX-10).



### 2.4.3.1 Mount Resistors

Secure the 2 resistors with the hardware provided as shown in Figure 2-1 on page 2-4. Solder the black and red wires in place according to the *Interconnect* diagram.

### 2.4.3.2 Mount ACC+ Board

a. Using the mounting plate as a template, mark the four outside corners and mounting holes. Drill holes as necessary, based upon connector size.

b. Attach mounting plate to transmitter's center compartment right side wall, just above Oscillator board.

c. Attach ACC+ board and terminal strip to mounting plate standoffs with hardware provided.

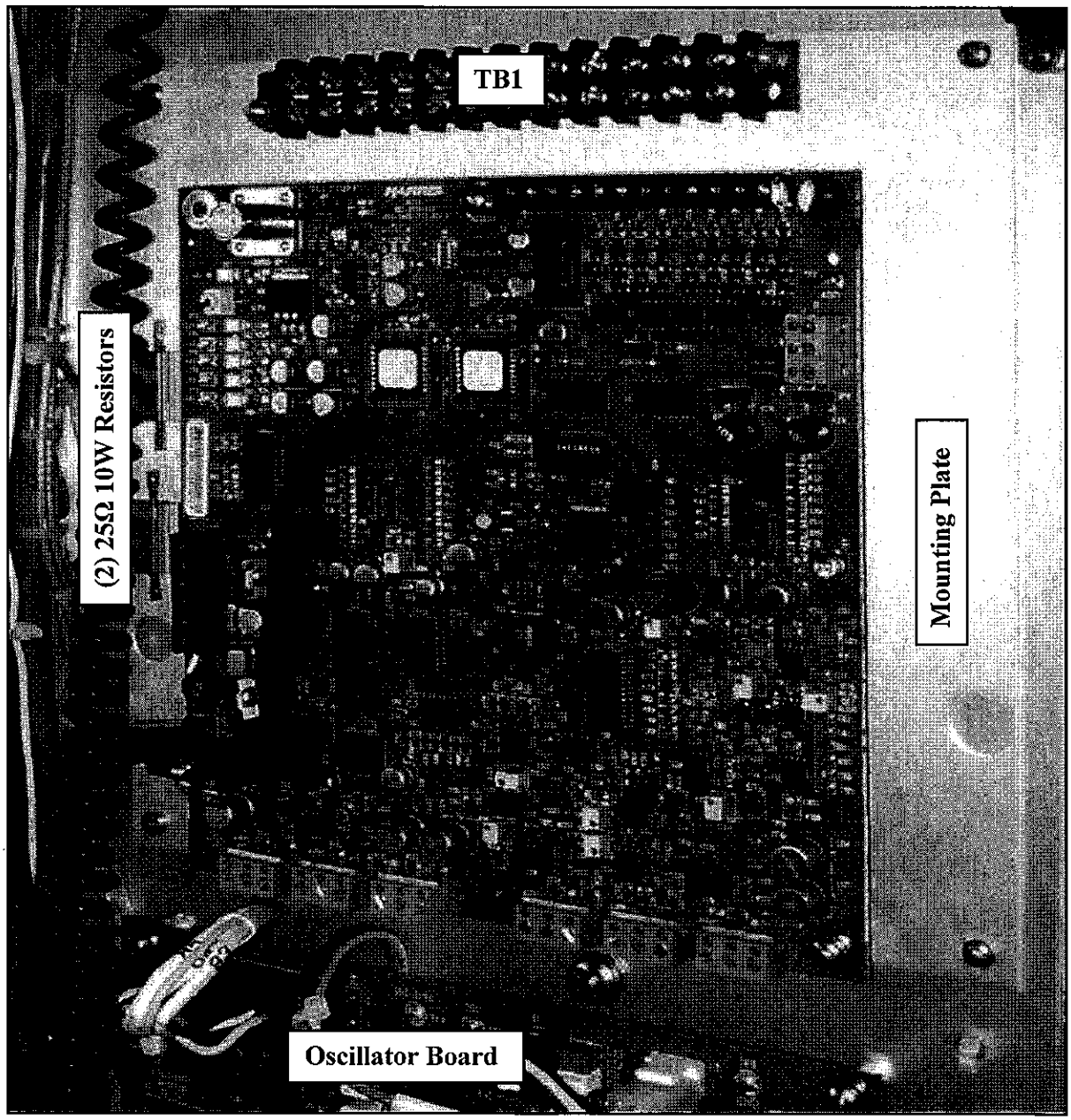



**Figure 2-1**
**ACC+ Board on Mounting Plate in DX10, Showing Location of the Resistors and TB1**


**WARNING: Disconnect primary power prior to servicing.**

## 2.4.3.3 Make Audio, RF and Voltage Connections

**CAUTION:**
*DISCONNECT PRIMARY POWER BEFORE ACCESSING THE RECTIFIER COMPARTMENT.*

a. Disconnect primary power.

b. Open the front Rectifier compartment panel and locate Power Distribution board.

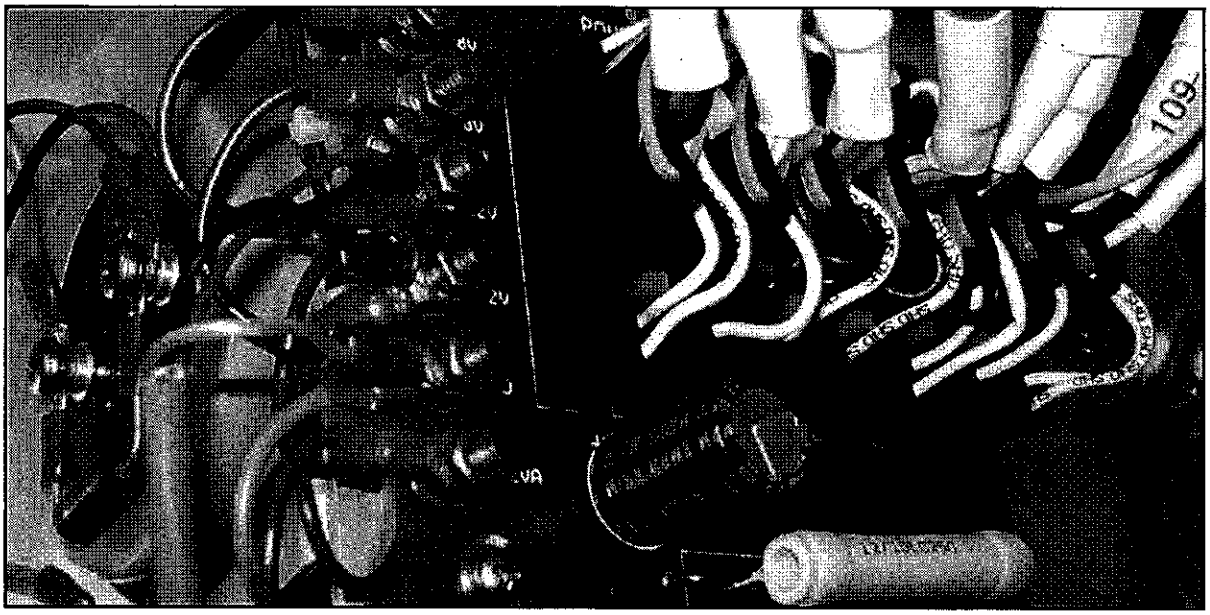


**Figure 2-2**
**Power Distribution Board of DX-10**
**(Located on the Front Upper Left Hand Sidewall of Rectifier Compartment)**

**NOTE:**
Refer to **Interconnect Diagram 843-5523-792 Rev G** or later, and the **Component Locator** at Figure 3-1 on page 3-3, for the following connections:

c. Using the 3-conductor cable #33, connect the **red wire lug to -22V** terminal; **black wire lug to the +22V** terminal; and the **clear wire lug to GND.**

d. Run the loose end of the cable through the hole grommet in the sidewall above the ACC+ board, and connect to corresponding TB1 terminals.

e. Connect the **red** and **black** wire lugs of **cable #32** from corresponding TB1 terminals to **R1/R2**. Solder wires at resistors.

f. Connect the **red** and **black** wire lugs of **cable #31** from **R1/R2** to the corresponding VDC inputs of the ACC+ board.

⚠ **CAUTION:**
*BE SURE TO MAINTAIN POSITIVE (+) AND NEGATIVE (-) VOLTAGE POLARITY CONTINUITY IN STEPS "C" THROUGH "F".*

g. Connect clear-jacketed wire of **cable #31** to the clear-jacketed wire of **cable #32**. Solder and wrap protectively.

h. Reconnect primary power but **leave circuit breakers CB1 and CB2 off.**

i. Using the supplied coax cable kit, connect between the **ACC+** Carrier Input BNC jack (J2) and the **Oscillator** board Frequency Monitor Output BNC jack (J5).

j. Using the 2-conductor (plus shield) audio **cable #30**, connect audio input to the **External Interface** board running the audio cable through the channel above the door.

k. Connect this audio **cable #30** to the corresponding TB1 terminals, according to *Interconnect* Diagram.

l. Connect **cable #29** from TB1 to TB1, accordingly.

m. Make ACC+ *Audio In* cable **#27** connection between the corresponding TB1 terminals and **J10** of ACC+ board.

n. Make ACC+ *Audio Out* cable **#28** connection between the corresponding TB1 terminals and **J3** of ACC+ board.

o. Connect customer audio in from processor/STL to terminals 1, 2, & 3 of TB1.

**NOTE:**
Be sure to maintain maintain positive (+) and negative (-) audio polarity throughout steps "j" through "o".

p. Loop, tie up, and secure any loose or extra cable lengths.

## 2.4.4 Analog Input Board Modifications

a. Remove the **Analog Input** board from Transmitter.

b. Solder a jumper across C6 and C7, and also across R28. This allows DC level input for ACC+ operation.

c. Reinstall the **Analog Input** board into the Transmitter.

# 2.5 Initial Settings After Installation

a. Turn circuit breakers CB1and CB2 back on.

b. On the **Analog Input** board adjust R27 Maximum Power fully counter clockwise.

c. *Ensure ACC+ is turned off or bypassed, with switch S2 (Switch is down, DS1 is off).*

## 2.5.1 Select ACC+ Curve (S1)

Configure the ACC+ board for the operation desired by referring to the tables below and the curve graph (Figure 1-1 on page 1-4) in Section 1. Variables to determine operation are % of modulation: **40%-80%**, **42.5%-85%**, **45%-90%** or **47.5%-95%** and the level at which the power will stop reducing: -1, -2, -3, -4, -5 or -6dB.

1. When looking at the installed board with the J2 BNC connector to the top left corner, S1-8 is on the Left and S1-1 is on the Right. The switch should be clearly marked
2. *0 means the switch is closed, or in the ON position* (switch is in the DOWN position when viewed with the BNC connector at the top left corner as installed).
   *1 means the switch is open or in the OFF position* (switch is in the UP position when viewed with the BNC connector at the top left corner as installed).

**NOTE:**
***The CPLD must be reset*** in order for the changes of S1 to become active. To do this, press S4 on the ACC+ board *after you change the settings of S1.*

3. **Example: -6dB, 45% - 95%**
   For practice please reference the following picture and set the individual switches as indicated below and as shown in the picture.
   S1-8 = 0 Switch to ON position
   S1-7 = 0 Switch to ON position
   S1-6 = 0 Switch to ON position
   S1-5 = 0 Switch to ON position
   S1-4 = 0 Switch to ON position
   S1-3 = 1 Switch to OFF position
   S1-2 = 0 Switch to ON position
   S1-1 = 1 Switch to OFF position

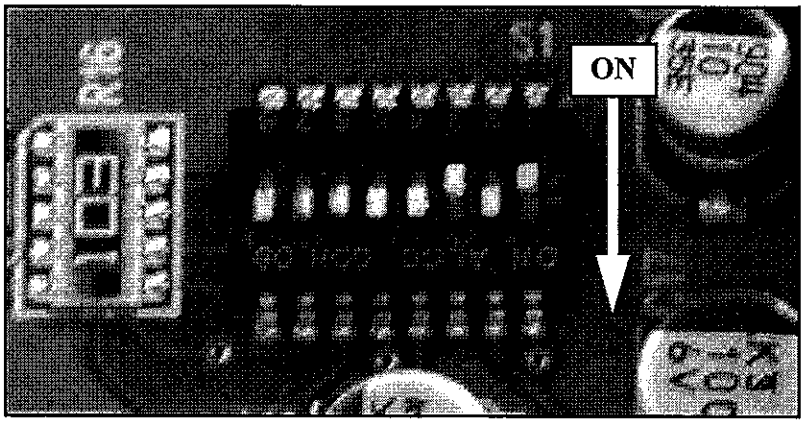



**Figure 2-3**
**S1 Shown in *Example* Position (*-6dB 45% - 95%*)**

*Table 2-2*
*Curve Select Switch S1 Settings*
*ON = 0, OFF = 1*

| 47.5% - 95 % modulation | | | | | | |
|---|---|---|---|---|---|---|
| Switch | -1dB | -2dB | -3dB | -4dB | -5dB | -6dB |
| S1-1 | 0 | 1 | 0 | 1 | 0 | 1 |
| S1-2 | 0 | 0 | 1 | 1 | 0 | 0 |
| S1-3 | 0 | 0 | 0 | 0 | 1 | 1 |
| S1-4 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1-5 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1-6 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1-7 | 0 | 0 | 0 | 0 | 0 | 0 |

*Table 2-3*
*Curve Select Switch S1 Settings*
*ON = 0, OFF = 1*

| 45% - 90 % modulation | | | | | | |
|---|---|---|---|---|---|---|
| Switch | -1dB | -2dB | -3dB | -4dB | -5dB | -6dB |
| S1-1 | 0 | 1 | 0 | 1 | 0 | 1 |
| S1-2 | 1 | 1 | 0 | 0 | 1 | 1 |
| S1-3 | 1 | 1 | 0 | 0 | 0 | 0 |
| S1-4 | 0 | 0 | 1 | 1 | 1 | 1 |
| S1-5 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1-6 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1-7 | 0 | 0 | 0 | 0 | 0 | 0 |

*Table 2-5*
*Curve Select Switch S1 Settings*
*ON = 0, OFF = 1*

| 42.5% - 85 % modulation | | | | | | |
|---|---|---|---|---|---|---|
| Switch | -1dB | -2dB | -3dB | -4dB | -5dB | -6dB |
| S1-1 | 0 | 1 | 0 | 1 | 0 | 1 |
| S1-2 | 0 | 0 | 1 | 1 | 0 | 0 |
| S1-3 | 1 | 1 | 1 | 1 | 0 | 0 |
| S1-4 | 1 | 1 | 1 | 1 | 0 | 0 |
| S1-5 | 0 | 0 | 0 | 0 | 1 | 1 |
| S1-6 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1-7 | 0 | 0 | 0 | 0 | 0 | 0 |

*Table 2-4*
*Curve Select Switch S1 Settings*
*ON = 0, OFF = 1*

| 40% - 80 % modulation | | | | | | |
|---|---|---|---|---|---|---|
| Switch | -1dB | -2dB | -3dB | -4dB | -5dB | -6dB |
| S1-1 | 0 | 1 | 0 | 1 | 0 | 1 |
| S1-2 | 1 | 1 | 0 | 0 | 1 | 1 |
| S1-3 | 0 | 0 | 1 | 1 | 1 | 1 |
| S1-4 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1-5 | 1 | 1 | 1 | 1 | 1 | 1 |
| S1-6 | 0 | 0 | 0 | 0 | 0 | 0 |
| S1-7 | 0 | 0 | 0 | 0 | 0 | 0 |


**WARNING: Disconnect primary power prior to servicing.**

## 2.5.2 Select ACC+ Phase Delay (S3)

For optimum ACC+ performance, the audio must be delayed by 1mS on this board. With dual channel oscilloscope probes on TP8 and TP12, you can verify the delay of 1mS after the following switch settings have been made *and the CPLD has been reset.*

Using the dipswitch weighting listing below, divide each by your carrier frequency to determine the individual delays for each position. **Then determine which switches will need to be enabled (set to OFF or up)** to provide the total 1mS delay for your carrier frequency. **All unused switches should be ON or down (logic 0).**

- S3- 1 = 8192
- S3- 2 = 4096
- S3- 3 = 2048
- S3- 4 = 1024
- S3- 5 = 512
- S3 6 = 256
- S3 7 = 128
- S3- 8 = 64

**NOTE:**
***The CPLD must be reset*** in order for the changes of S3 to become active. To do this, press S4 on the ACC+ board *after you change the settings of S3.*

**Example:**

Using the table below that was created *based on a carrier frequency of 1089kHz*, the added delays of switches #4 and #8 create a total delay of 0.999mS. This is the closest value, to 1mS, attainable with this switch configuration.

**NOTE:**
It is better to be slightly over 1mS, than under.

Table 2-1 Example Phase Delay Chart

| S3 | Weighting | Carrier Frequency | Delay (mS) |
|---|---|---|---|
| 1 | 8192 | 1089000 | 7.522 |
| 2 | 4096 | 1089000 | 3.761 |
| 3 | 2048 | 1089000 | 1.881 |
| 4 | 1024 | 1089000 | 0.940 |
| 5 | 512 | 1089000 | 0.470 |
| 6 | 256 | 1089000 | 0.235 |
| 7 | 128 | 1089000 | 0.118 |
| 8 | 64 | 1089000 | 0.059 |

# 2.6 ACC+ Setup for DX Transmitters

This section provides alignment information for the ACC+ Adaptive Carrier Control board.

The ACC+ board will require field adjustment for frequency and antenna effects. Also, in the event the ACC+ board requires replacement, and for new installations, this section is intended to provide guidance to establish ACC+ board level alignment.

**NOTE:**
See the Component Locator Figure 3-1 on page 3-3, to help locate potentiometers and testpoints for the procedures below. Also see Table 6-1 on page 6-2 for a listing of testpoints, jumpers, LEDs, and potentiometers.

a. Jumper settings are JP1: 1-2, JP2:1-2, JP3:1-2, JP4: 1-2, JP5: 2-3.

b. Connect Audio Input and Audio Output to/from an audio generator.

c. Connect Carrier Input and terminate for 50 Ohms input; input level is 1Vrms to 3Vrms.

d. Set audio generator output level to 10dBm for 600 Ohms, and audio frequency @ 1kHz.

e. Turn audio generator output on.

f. Turn DX transmitter low voltage on.

g. If not already done, set dipswitche S3 to customer Phase Delay setting (On is "0"). See "2.5.2 Select ACC+ Phase Delay (S3)" on page 2-9.

h. If not already done, set dipswitches S1 to customer Curve selection (On is "0"). "2.5.1 Select ACC+ Curve (S1)" on page 2-7

i. Ensure S2 is set to ACC mode OFF (Switch is down, DS1 is off).

j. Monitor TP16 with an oscilloscope; adjust R76 until the peak to peak voltage is 7.60V.

k. Monitor TP8 with an oscilloscope; adjust R64 for 1.0V peak to peak.

l. Monitor TP12 with an oscilloscope; adjust R68 until the peak to peak voltage is 7.0V (7.0V = 10dBm @ 600 Ohms).

m. Adjust R78 and measure TP11 for 5.0 +/-0.02V using a digital voltmeter (DVM) negative probe on chassis ground.

n. Using an oscilloscope, set a zero volt DC reference on the display and monitor TP20. With the scope probe DC coupled, adjust R105 until the bottom of the sine wave touches the zero reference level on the scope. It may be helpful to amplify the signal on the scope for ease of adjustment.

o. While monitoring TP20 with the oscilloscope, adjust R113 until the peak to peak voltage is 3.0V.

p. Adjust R119 fully clockwise (CW).

q. Adjust R121 fully CW.

r. Switch S2 to ACC mode ON (Switch is up, DS1 is on).

s. While monitoring TP20 with an oscilloscope, adjust R104 until the bottom of the sine wave touches the zero reference level on the scope. It may be helpful to amplify the signal on the scope for ease of adjustment.

t. While monitoring TP20 with the oscilloscope, adjust R119 CW for a peak to peak voltage of 3.0V.

u. Switch S2 to ACC mode OFF (Switch is down, DS1 is off).

v. Turn transmitter on and slowly raise power by pressing the RAISE button to maximum while ensuring transmitter does not exceed desired power level.

**NOTE:**
If the transmitter attains the desired output, yet still can raise further, it will be necessary to reduce the carrier by adjusting R113 counter clockwise.

w. Use R105 and R113 to make the adjustment to produce the desired power level at 100% modulation.

**NOTE:**
*R105 and R113 interact:*
*Turning R105 counter clockwise (CCW) causes carrier level to decrease and modulation to increase while turning it CW causes carrier level to increase and modulation to decrease.*
*Turning R113 CCW causes carrier level to decrease and turning it CW causes carrier level to increase (while having no significant effect on modulation).*

x. Switch S2 to ACC mode ON (Switch is up, DS1 is on).

y. Use R104 and R119 to attain full power with 100% modulation.

**NOTE:**
R104 and R119 interact:
Turning R104 CCW causes carrier level to decrease and modulation to increase while turning it CW causes carrier level to increase and modulation to decrease.
Turning R119 CCW causes carrier level to decrease, and turning it CW causes carrier level to increase (while having no significant effect on modulation).

z. Remove modulation and verify desired power level reduction (See tables at "2.5.1 Select ACC+ Curve (S1)" on page 2-7). Minor re-adjustment to R104 and R119 may be needed to satisfy both conditions: *with* 10dBm audio and with*out* audio.

aa. As a final step, using program modulation, select between ACC ON and OFF while observing negative modulation. Turn R104 slightly (for example, turning CCW will decrease the modulation level but will also increase the carrier level) then adjust R119 (for example, turning CCW to lower the carrier level) back to the desired power level.

To aid in the final alignment, the following list is a description of what affect adjusting the 4 most important potentiometers has.

- **ACC Bypassed or OFF**
  ***R105* DC Offset:**
  **CCW** causes Carrier level to decrease and Modulation level to increase.
  **CW** causes Carrier level to increase and Modulation level to decrease.
- **ACC ON or OFF** (normally aligned with ACC off)
  ***R113* Audio+DC Gain:**
  **CCW** causes Carrier level to decrease.
  **CW** causes Carrier level to increase.
- **ACC Operate Mode**
  ***R104* DC Offset:**
  **CCW** causes Carrier level to decrease and Modulation level to increase.
  **CW** causes Carrier level to increase and Modulation level to decrease.
- **ACC Operate Mode**
  ***R119* Audio+DC Trim:**
  **CCW** causes Carrier level to decrease.
  **CW** causes Carrier level to increase.

## 2.7 ACC+ Verification Procedure

a. Connect audio cable to the ACC board.

b. Set audio generator to +10 dBm or customer specified level.

c. Choose a Carrier Reduction Curve setting with S1.

d. Connect the audio output of the ACC board to the audio analyzer and connect a scope and a DMM to TP20 on the ACC Board.

e. For this example we will use (-6db) for 47.5% to 95% S1 dip switch set to 0000101.

f. Turn audio off from audio generator.

g. Turn ACC off with the S2 on the ACC board.

h. Observe DC Value with DMM at TP20 and record it here _____Vdc (Value 1 example 2.0Vdc).

i. Turn on ACC with the S2 on the ACC board.

j. Observe DC value with DMM at TP20 and record it here _____Vdc (Value 2 example 1.000Vdc).

k. Calculate the dB difference between the 2 values. 20 Log (value 1/value 2) example 6dB.

l. This value should correspond to the chart. With 0% input audio the carrier should drop 6dB.

**NOTE:**
dB in the next formula should be *negative* because you are minus 6db from 0. Example -6dB.

m. Use this formula to calculate the carrier power in percent. (Inv Log (dB/10) *100 = Cp). Carrier power in percent. Example 25%.

**NOTE:**
This verifies that the ACC board is working at 100% and 0% input audio.

n. Turn ACC ON with S2 on the ACC board.

o. Next, adjust the input audio from 0% to 100%. Example 10dBm = 4.898 Vrms on the audio generator.

**NOTE:**
This value is Audio Precision specific; your values may be different for dBm to VRMS.

100% audio = 4.898 Vrms
90% Audio = 4.898 * .9
80% Audio = 4.898 * .8 and so on

p. Observe the Peak-to-Peak waveform on the scope as you adjust the input audio from 0% to 100%.

q. Verify that the waveform negative peak never exceeds the ground reference until you go over 100% Input Audio.

r. Verify that the output DC value does not increase as the input audio is increased over 100%.

**NOTE:**
40% to 80% means that the DC Level out (Carrier Control) of the ACC board will not decrease until the Input Audio is below 80% and will continue to decrease until you reach 40% input Audio. Then it will remain constant.

# 2.8 Initial Turn On

a. Turn transmitter on HIGH.

b. Turn ACC+ on with S2 on the ACC+ board (Switch is up, DS1 is on).

## 2.8.1 Simplified ACC+ Verification

Another method of ACC+ is shown below.

a. Using an oscilloscope and the transmitter's forward power meter; or using a spectrum analyzer and modulation monitor connect the transmitter modulation monitor sample to the equipment described above.

b. Reduce audio input in 1 dB steps and record the level of carrier reduction and percentage of modulation.

c. Verify that the forward power of the transmitter as well as the percentage of modulation, is reduced according to the selected curve (See Figure 1-1 on page 1-4).

**NOTE:**
Errors in transmitter forward power metering at reduced powers or spectrum analyzer/modulation monitor calibration, may contribute to inaccuracies.

# Section 3 Operation

3

## 3.1 Introduction

This section contains normal operational procedures and information pertaining to the function of the ACC+ Adaptive Carrier Control.

## 3.2 Operation

This operational procedure is presented under the assumption that the controller has been properly installed and checked out as outlined in Section II, Installation/Initial Turn-On, of this manual.

a. Normal ACC Bypass and ACC On operation

b. Identification of all panel controls and indicators

### 3.2.1 ACC+ Bypass

With the transmitter turned on, and ACC in Bypass, the forward power meter should show the power level selected and not change significantly with modulation.

### 3.2.2 ACC+ On

With the transmitter turned on, and ACC on it is normal to see the carrier power level fluctuate with modulation and DS1 indicator (ACC On) will be illuminated amber (yellow). The amount of carrier power level fluctuation will be determined by the curve selected.

## 3.2.3 Controls and Indicators

Figure 3-1, below, shows the following components' location:

- ON/BYPASS switch S2 (upper left corner of board)
- ON/BYPASS indicator DS1 (upper left corner of board)
- S1 Curve selection
- S3 Phase Delay selection
- J10 Audio Input connector
- JP3 and JP4 Audio Input Impedance selector
- J2 Carrier Input connector
- JP1 Carrier Input Termination selector
- All potentiometers
- J9 Remote Control connector
- J3 - J8Audio Output connectors
- J1 DC Power Input connector
- DC Power Supply connectors

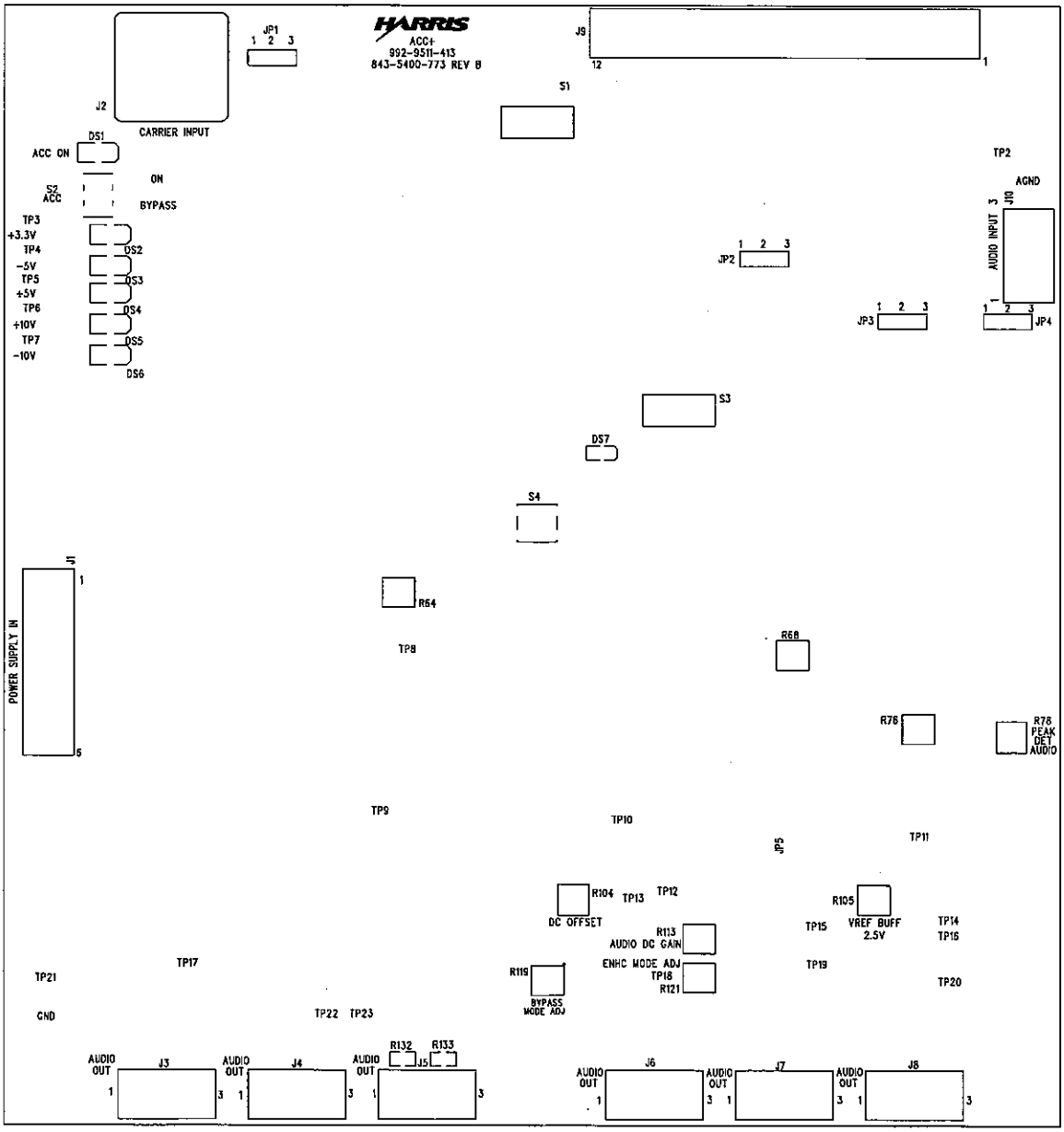



**Figure 3-1**
**Component Locator**



**WARNING: Disconnect primary power prior to servicing.**

# Section 4 Theory of Operation

4

## 4.1 Introduction

This section presents the the circuit description of the ACC+ Adaptive Carrier Control.

Refer to Figure 4-1 Block Diagram and Figure 6-1 on page 6-5, Simplified Schematic.

### 4.1.1 ACC OFF Mode of Operation

The ACC mode can be turned OFF by putting S2 in the bypass position. When this is in bypass, the ACC feature is disabled and the output power of the transmitter will remain steady at the selected power level. DS1 will not be illuminated.

### 4.1.2 ACC+ ON Mode of Operation

The ACC mode can be turned ON by putting S2 in the ACC-ON position. When this mode is ON, the ACC feature is active and the output power of the transmitter will fluctuate with the % of modulation. DS1 will be illuminated amber.

## 4.2 Detailed Circuit Description

Refer to the schematic, 843-5400-771 in the back of this technical manual for the following discussion.

### 4.2.1 Audio Input

Audio input is connected to J10:

| | |
|---|---|
| J10-1 | + Audio |
| J10-2 | Ground |
| J10-3 | - Audio |

The input audio signal is filtered and buffered through a low pass filter and differential op-amp U21. Audio input impedance is selected by JP3 and JP4:

JP3 1-2 & JP4 1-2 = 600 Ohms
JP3 2-3 & JP4 2-3 = high impedance

The buffered audio signal is then scaled and peak detected, with a fast attack and slow decade peak detector circuit consisting of U25 and U31.

### 4.2.2 A/D Converter - Look Up Table

The DC level at TP14 is varying according to the audio input level. The peak-detected voltage is converted to a 12-bit digital data by the A/D converter (U16). The 12-bit word is then addressed to the pre-stored Look-Up-Table (LUT) content in the memory devices (U10, U9). The output of the LUT also has 12-bits of resolution and will vary according to the ACC curve that was selected.

### 4.2.3 D/A Converter

The 12-bit data from the LUT is then converted to transmitter's carrier level by the D/A converter (U13). The output is then adjusted by the DC offset control R104 and applied to switch U28.

### 4.2.4 Phase Delay

The non-sampled audio coming from U21 is fed into a A/D Converter (U14). The Digital out is then fed into a High Speed CMOS D-Type Flip Flop. The outputs of this drive a CPLD where, depending on the S3 settings, it will determine the amount of delay. The output of the CPLD is then fed to a D/A converter. The Output of the D/A then goes thru a DC blocking cap (C130) and then U15. R68 provides the DC Offset. This DC carrier level from U15 and the delayed audio signal are then summed through the opamp U30, with gain adjustment control from R113. This Audio + DC output is then applied to the audio driver.

### 4.2.5 Curve Selection

S1 selects which curve is selected by a series of pull-up resistors formed by R16 in conjunction with U10 and U9.

U29, U35, and U36 are a set of analog switches that allow the switching of the different modes of operation. These are bypass mode and normal ACC mode.

### 4.2.6 Carrier Synchronization

All digital circuits are operating synchronously, all of the clock pins are tied to the transmitter's carrier frequency for best performance and minimized inter-modulation products.

A carrier RF sample is obtained by a sample from the Oscillator board. JP1 is normally set 1-2 for a 50 Ohm termination.

### 4.2.7 Remote Control

The ACC+ board is capable of remote and local table selection; it can be programmed to store up to 32 different ACC curves with 12-bit dynamic resolution.

J9 is the remote control connection. Remote control selection is activated by ground sync connection and buffered by opto isolators U5 through U8. Connecting the appropriate J9 connector to ground through J9-1 through J9-7 will activate the same function as S1.

### 4.2.8 Audio+DC Output Driver

The Audio+DC output is then connected to the transmitter's normal audio input through the Audio Driver.

The Audio Driver stage is fanned out to 6 outputs at J3 through J8. Each audio signal pair is buffered by a set of differential driver op-amps. For single transmitter configurations, J3 is typically used:

| | |
|---|---|
| J3-1 | + Audio |
| J3-2 | Ground |
| J3-3 | - Audio |

### 4.2.9 Power Supplies

Board DC power is normally supplied from the existing DC supplies within the transmitter. Typically a +VDC from the transmitter cabinet's Power Distribution board will be connected to J1-4, and a -VDC will be connected to J1-6.

These supplies are regulated to +10, -10, +5, -5 and +3.3 VDC on the ACC+ board by regulators U1 through U4 and U9. Test points and indicators are provided near the edge of the board as troubleshooting aids.

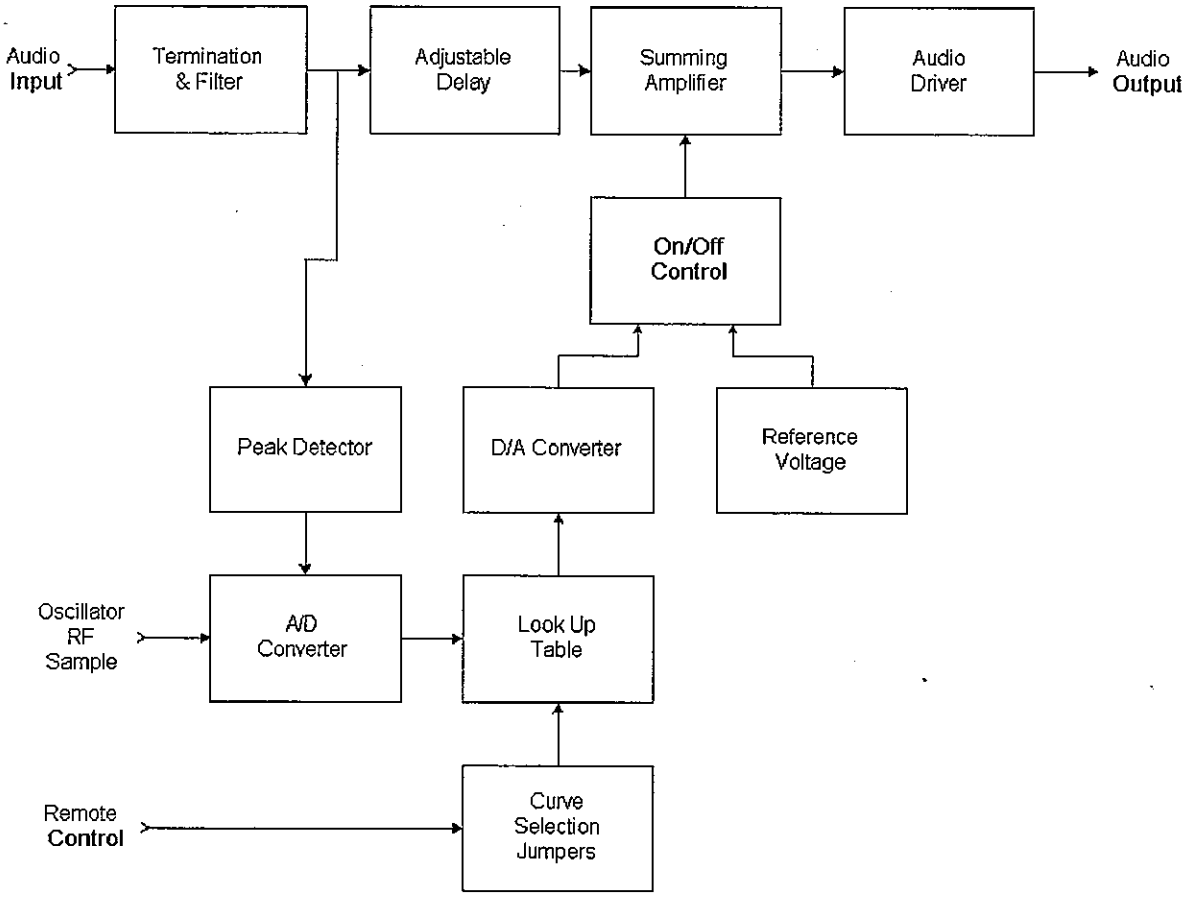



**Figure 4-1**
**ACC+ Block Diagram**

# Section 5 Maintenance and Alignments

5

## 5.1 Introduction

This section provides alignment information for the ACC+ Adaptive Carrier Control board.

## 5.2 Purpose

The ACC+ board will require field adjustment for frequency and antenna effects. Also, in the event the ACC+ board requires replacement, this section is intended to provide guidance to establish ACC+ board level alignment.

## 5.3 Select ACC+ Curve (S1)

See"2.5.1 Select ACC+ Curve (S1)" on page 2-7 for this complete procedure.

## 5.4 Select ACC+ Phase Delay (S3)

See"2.5.2 Select ACC+ Phase Delay (S3)" on page 2-9 for this complete procedure.

## 5.5 ACC+ Alignment for DX Transmitters

See"2.6 ACC+ Setup for DX Transmitters" on page 2-11 for this complete procedure.

# 5.6 ACC+ Verification Procedure

See"2.7 ACC+ Verification Procedure" on page 2-13 for this complete procedure.

# Section 6 Troubleshooting

6

## 6.1 Introduction

Troubleshooting of ACC+ consists of reading this manual and verifying proper installation and alignment. The following can be used as a guide. See Table 6-1 on page 6-2 for a listing of testpoints, jumpers, LEDs, and potentiometers.

## 6.2 Troubleshooting Hiearchy

### 6.2.1 Power Supplies

Verify power supplies are present at J1-4 and J1-6, and observe power supply indicators DS2-DS6.

### 6.2.2 Carrier Sync

Verify Oscillator sample at TP9. A 5Vp-p square wave at carrier frequency should be present.

### 6.2.3 Jumper Settings

Verify jumper settings are as described in sections 2 and 4 of this manual.

### 6.2.4 Audio Input/Output

Use an oscilloscope to verify correct audio signal at ACC+ input, J10. Also check for an audio output signal at J3.



**WARNING: Disconnect primary power prior to servicing.**

## 6.3 ACC bypass mode

Refer to the ACC+ schematic for jumper arrangements when bypassing the ACC+ function.

In addition to moving the jumper wire to bypass the function the Analog Input (or Audio Input) board in the transmitter must be adjusted.

Refer to the Analog Input board schematic in the transmitter drawing package for specific jumper and potentiometer numbers. Also refer to the transmitter instruction book for the set up procedure of the board.

First the Analog Input board will have to be AC coupled by moving jumpers that were in DC couple mode when using the ACC+ board. The Audio Gain adjustment and Max Power Adjustment will need to be set up with the ACC+ in bypass mode.

## 6.4 Component Table

The following table displays important testpoints jumpers LEDs and potentiometers.

**Table 6-1 Pertinent Testpoints, Jumpers, LEDs, & Potentiometers**

| Test Point | LED (DS) or Jumper | Pot. | Name / Function | Comment / Value |
|---|---|---|---|---|
| | DS1 | | ACC+ On | Illuminates when ACC+ is Enabled |
| | DS7 | | Reset | |
| TP1 | | | Carrier Input | |
| TP2 | | | GND A | |
| TP3 | DS2 | | +3.3Vdc | |
| TP4 | DS3 | | -5Vdc | |
| TP5 | DS4 | | +5Vdc | |
| TP6 | DS5 | | +12.7Vdc | |
| TP7 | DS6 | | -12.7Vdc | |
| TP8 | | R64 | Non-Sampled Audio | 1.0 - 1.2Vp-p |

Table 6-1 Pertinent Testpoints, Jumpers, LEDs, & Potentiometers

| Test Point | LED (DS) or Jumper | Pot. | Name / Function | Comment / Value |
|---|---|---|---|---|
| TP9 | | | 0.5V P-P | |
| TP10 | | | Audio DC Offset | |
| TP11 | | R78 | Audio | +5.0Vdc ±0.02Vdc |
| TP12 | | R68 | Delayed Audio | 6.93 - 7.2Vp-p |
| TP13 | | | | |
| TP14 | | | Peak Detected Audio | |
| TP15 | | | V Rdf Buffer 2.5Vdc | |
| TP16 | | R76 | Audio | +7.6Vdc |
| TP17 | | | Audio Outputs | |
| TP18 | | | Audio Outputs | |
| TP19 | | | Audio Outputs | |
| TP20 | | R104 | Audio Outputs | 3.0Vp-p on zero reference |
| TP21 | | | GND | |
| TP22 | | | Audio Outputs | |
| TP23 | | | Audio Outputs | |
| | | R105 | | VREF Buffer 2.5Vdc (Non-ACC Carrier Level Adjust) |
| | | R113 | | Audio+DC Gain Adjust |
| | | R119 | | ACC On Audio+DC Gain Adjust |
| | | R121 | | Enhanced Mode Adjust |
| | JP1 | | Carrier Input Impedance Select | 1-2: 50Ω Carrier Input<br>2-3: High Impedance Carrier Input |
| | JP2 | | Remote Activation of Enhanced Mode | 2-3: Enables Remote Activation of Enhanced Mode |


WARNING: Disconnect primary power prior to servicing.

Table 6-1 Pertinent Testpoints, Jumpers, LEDs, & Potentiometers

| Test Point | LED (DS) or Jumper | Pot. | Name / Function | Comment / Value |
|---|---|---|---|---|
| | JP3 | | Audio Input Impedance Select | 1-2: 600Ω Audio Input Impedance<br>2-3: High Audio Input Impedance |
| | JP4 | | Audio Input Impedance Select | 1-2: 600Ω Audio Input Impedance<br>2-3: High Audio Input Impedance |
| | JP5 | | Inverted or Non-Inverted Peak Detector | 1-2: Positive Audio Detection<br>2-3: Negative Audio Detection |

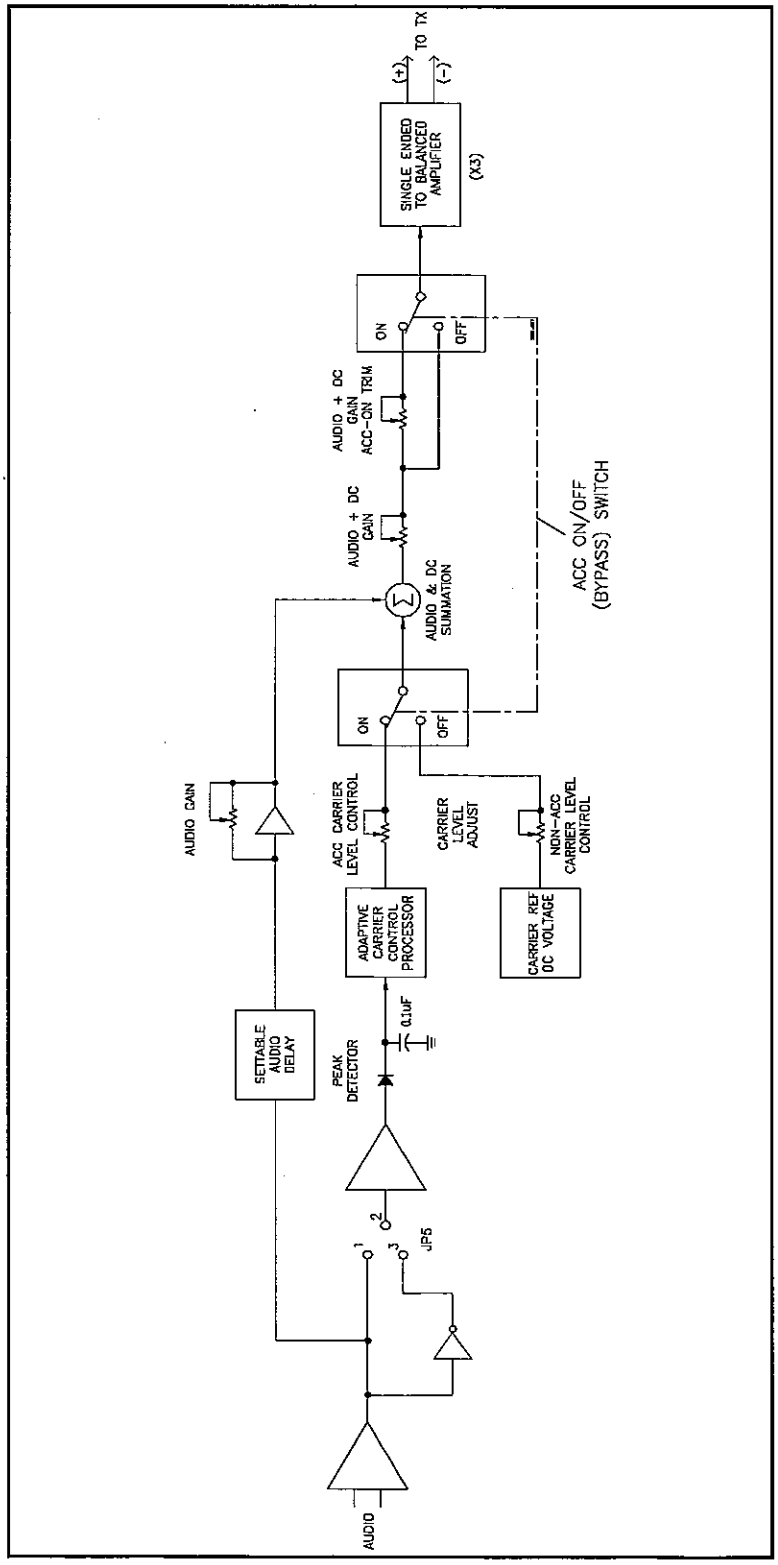



**Figure 6-1 Simplified Schematic**



**WARNING: Disconnect primary power prior to servicing.**

# Section 7 Parts List

7

## 7.1 Parts List

**Table 7-1 ACC+ KIT, LOW POWER AM - 992 9764 371 (F)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 464 0349 000 | TOOL, ADJUSTMENT | 2 EA | |
| 542 1735 000 | RES 25 OHM 1% 10W | 2 EA | |
| 614 0505 000 | TERM BD 12 TERM | 1 EA | |
| 843 5523 792 | ACC+ AUDIO CONNECTION DIAGRAM DX | 0 DWG | |
| 917 2332 772 | CABLE, RF ACC+ INTERCONNECT | 1 EA | |
| 917 2332 773 | CABLE PKG, ACC+ INTERCONNECT | 1 EA | |
| 939 8220 414 | PANEL, ACC MOUNTING | 1 EA | |
| 992 9764 319 | ACC+ BOARD | 1 EA | |

**Table 7-2 CABLE, RF ACC+ INTERCONNECT - 917 2332 772 (A)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 296 0253 000 | TUBING, SHRINK 3/16 WHITE | 0.4 FT | |
| 618 0705 000 | *COAX, RG-316 | 14 FT | |
| 620 1913 000 | PLUG, BNC STRT CABLE | 2 EA | |
| 817 2332 772 | ASSY INST ACC+ INTERCONNECT RF | 0 DWG | |

**Table 7-3 CABLE PKG, ACC+ INTERCONNECT - 917 2332 773 (B)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 253 0059 000 | CABLE, 2C 22AWG AUDIO | 12 FT | |
| 253 0095 000 | CABLE 3C 20AWG 300V | 11 FT | |
| 296 0253 000 | TUBING, SHRINK 3/16 WHITE | 1.5 FT | |
| 296 0262 000 | TUBING, SHRINK 1/4 WHITE | 1 FT | |
| 354 0003 000 | LUG RING #10 22-18AWG RED | 3 EA | |
| 354 0005 000 | LUG SPADE #6 22-18AWG RED | 18 EA | |
| 817 2332 773 | CADS, ACC+ INTERCONNECT | 0 DWG | |

**Table 7-4 PANEL, ACC MOUNTING - 939 8220 414 (B)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 839 8220 414 | FAB INSTR, ACC MOUNTING | 0 DWG | |
| 001 5010 060 | SHEET, ALUM 0.063 THK (5052-H32) | 0.621 LB | |
| 358 1065 000 | STUD, PEM, 6-32 X 0.625 (FHS-632-10) | 2 EA | |
| 358 1551 000 | STANDOFF, PEM 6-32 X 0.5 (BSOS-632-16) | 6 EA | |

**Table 7-5 ACC+ BOARD - 992 9764 319 (B--)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 917 2332 718 | FIRMWARE, ACC+ | 1 EA | U9 U10 |
| 988 2509 002 | DOC PKG, ACC + | 1 EA | |
| 992 9511 413 | PWA, ACC+ | 1 EA | |

**Table 7-6 FIRMWARE, ACC+ - 917 2332 718 (A)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 393 0054 000 | IC, AT29LV010A (PLCC-32) | 2 EA | U9 U10 |
| 817 2332 718 | PROGRAMMING INSTRUCTION, ACC+ | 0 DWG | |

**Table 7-7 DOC PKG, ACC + - 988 2509 002 (A)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 888 2509 002 | TM, ACC + | 1 EA | |
| 917 2517 355 | DWG PKG, ACC + | 1 EA | |



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**Table 7-8 DWG PKG, ACC + - 917 2517 355 (C)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 817 2517 355 | DP INDEX, ACC+ | 0 DWG | |
| 830 0000 100 | DIVIDER, SECTION - 100 | 0 DWG | |
| 817 2517 356 | FAMILY TREE, ACC+ KITS | 0 DWG | |
| 830 0000 200 | DIVIDER, SECTION - 200 | 0 DWG | |
| 843 5523 883 | ACC+ AUDIO CONNECTION DIAGRAM 3DX | 0 DWG | |
| 843 5507 882 | ACC + AUDIO CONNECTION DIAGRAM | 0 DWG | |
| 843 5523 792 | ACC+ AUDIO CONNECTION DIAGRAM DX | 0 DWG | |
| 843 5215 578 | WIRING DIAG, ACC+ | 0 DWG | |
| 830 0000 300 | DIVIDER, SECTION - 300 | 0 DWG | |
| 843 5400 771 | SCH, ACC+ | 0 DWG | |

**Table 7-9 PWA, ACC+ - 992 9511 413 (F)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 404 0908 000 | *HEATSINK, VERTICAL, TO-220 | 3 EA | XU18 XU26 XU33 |
| 522 0588 000 | CAP 100UF 25V 20% 8MM NON-POLAR | 1 EA | C130 |
| 610 1069 000 | HDR, 9C 1ROW VERTICAL UNSHR | 1 EA | J99 |
| 612 1184 000 | JUMPER SHUNT, 2C, 0.1" PITCH | 5 EA | XJP1 XJP2 XJP3 XJP4 XJP5 |
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 817 2551 014 | PROGRAMMING INSTR, ACC/DELAY | 0 DWG | #U16 |
| 614 0953 005 | *TERMINAL STRIP, 6 TERM | 1 EA | J1 |
| 620 1677 000 | JACK, BNC STRAIGHT PCB | 1 EA | J2 |
| 614 0909 000 | TERM BLK, PCB, 3-POLE, GREY (237) | 7 EA | J3 J4 J5 J6 J7 J8 J10 |
| 614 0953 006 | *TERMINAL STRIP, 12 TERM | 1 EA | J9 |
| 610 0900 000 | HDR, 3C VERT 1ROW UNSHR | 5 EA | JP1 JP2 JP3 JP4 JP5 |
| 492 0881 000 | CHOKE, 10MH 20% 89MA RADIAL | 2 EA | L1 L2 |
| 382 1633 000 | IC, LT1033 ESD | 1 EA | U33 |
| 382 1328 000 | IC, 1085 ESD | 1 EA | U18 |
| 382 0184 000 | *IC, LM340A/LM7805AC (TO-220) | 1 EA | U26 |
| 566 0037 000 | CONVERTER, DC/DC 5V .75W ESD | 1 EA | U3 |
| 992 9511 414 | PWA, ACC+ SMT | 1 EA | |
| 843 5400 771 | SCH, ACC+ | 0 DWG | |

**Table 7-10 PWA, ACC+ SMT - 992 9511 414 (D)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 381 0029 000 | N-MOSFET, 2N7002 | 2 EA | Q1 Q2 |
| 383 0062 000 | IC, HI5741 ESD | 2 EA | U13 U24 |
| 383 0126 000 | IC, MAX705/ADM705 (SOIC-08) | 1 EA | U17 |
| 383 0140 000 | IC, DG419 SPDT SWITCH ESD | 3 EA | U29 U35 U36 |
| 383 0244 000 | IC, ILD206 | 5 EA | U4 U5 U6 U7 U8 |
| 383 0422 000 | IC 74HCT273 ESD | 4 EA | U11 U12 U22 U23 |
| 383 0431 000 | IC OPA2227 ESD | 8 EA | U19 U28 U30 U31 U34 U37 U38 U39 |
| 383 0432 000 | IC MAX 902 ESD | 1 EA | U1 |
| 383 0443 000 | IC LTC1414C ESD | 2 EA | U14 U15 |
| 383 0444 000 | *IC, MIC2940 (TO-263) | 1 EA | U2 |
| 383 0445 000 | IC, AD620 | 1 EA | U21 |
| 383 0446 000 | IC AD847 ESD | 1 EA | U25 |
| 383 0475 000 | IC 74HCT14 ESD | 1 EA | U27 |
| 383 0488 000 | IC, LM337 (D2PAK) | 1 EA | U32 |
| 383 0663 000 | IC, 72V265 ESD | 1 EA | U20 |
| 385 0001 000 | *DIODE, RECT MMBD4148/914 ESD | 20 EA | CR3 CR4 CR5 CR6 CR7 CR8 CR9 CR10 CR11 CR12 CR13 CR14 CR15 CR16 CR17 CR18 CR19 CR20 CR23 CR24 |
| 385 0008 000 | DIODE, SCHOTTKY 10MQ040N ESD | 3 EA | CR22 CR25 CR26 |
| 385 0012 000 | *DIODE, SCHOTTKY MBR0520 | 4 EA | CR1 CR2 CR21 CR27 |



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| | | | |
|---|---|---|---|
| 389 0004 102 | LED, GRN, 2.4MM ROUND ESD | 5 EA | DS2 DS3 DS4 DS5 DS6 |
| 389 0004 103 | LED, YEL, 2.4MM ROUND ESD | 1 EA | DS1 |
| 389 0010 001 | LED, RED 0805 DIFFUSED ESD | 1 EA | DS7 |
| 393 0086 000 | *CPLD, XC9536XL (QFP-44) | 1 EA | U16 |
| 404 0869 000 | SOCKET, PLCC-32, SMT | 2 EA | XU9 XU10 |
| 496 0095 000 | INDUCTOR 33UH +/-20% SMT | 2 EA | L3,L4 |
| 496 0114 000 | IND, POWER 250UH 20% | 1 EA | T1 |
| 515 0134 205 | *CAP 150PF 0805 C0G 100V 5% | 2 EA | C98 C105 |
| 515 0134 209 | *CAP 220PF 0805 C0G 100V 5% | 2 EA | C59 C60 |
| 515 0134 213 | *CAP 330PF 0805 C0G 100V 5% | 2 EA | C80 C84 |
| 515 0134 217 | *CAP 470PF 0805 C0G 100V 5% | 4 EA | C36 C40 C41 C73 |
| 515 0135 301 | *CAP 1000PF 1206 C0G 100V 5% | 2 EA | C77 C88 |
| 515 0136 401 | *CAP 0.01UF 0805 X7R 100V 10% | 1 EA | C127 |
| 515 0136 501 | *CAP 0.1UF 0805 X7R 50V 10% | 82 EA | C1 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C14 C18 C19 C20 C23 C24 C25 C26 C31 C32 C33 C34 C35 C37 C38 C39 C42 C43 C44 C45 C46 C47 C52 C55 C56 C63 C64 C66 C67 C68 C69 C70 C74 C75 C76 C78 C81 C82 C83 C85 C86 C87 C89 C90 C91 C92 C93 C94 C95 C96 C97 C100 C101 C102 C103 C106 C107 C109 C110 C111 C113 C115 C116 C117 C118 C119 C120 C123 C126 C128 C129 |
| 515 0137 601 | CAP 1UF 1206 X7R 25V 10% | 1 EA | C49 |
| 515 0139 601 | *CAP 1UF 1812 Z5U 50V 20% | 2 EA | C65 C71 |
| 523 0001 201 | CAP 100UF 6.3V 20% SMT | 18 EA | C13 C15 C16 C17 C21 C22 C27 C28 C29 C30 C50 C53 C54 C57 C58 C62 C79 C108 |
| 523 0002 201 | CAP 100UF 25V 20% 8MM 105C | 6 EA | C72 C114 C121 C122 C124 C125 |
| 523 0003 101 | CAP 10UF 35V 20% SMT | 7 EA | C2 C48 C51 C61 C99 C104 C112 |
| 540 1568 000 | RES NTWK 10K OHM 5% BUSS | 2 EA | R16 R30 |
| 545 0308 109 | RES 22.1 OHM 1% 1/8W 0805 | 35 EA | R31 R32 R33 R34 R35 R36 R37 R39 R40 R41 R42 R44 R45 R47 R48 R49 R51 R52 R53 R54 R55 R56 R57 R58 R59 R60 R61 R62 R93 R94 R95 R96 R97 R98 R99 |
| 545 0308 115 | RES 39.2 OHM 1% 1/8W 0805 | 12 EA | R128 R129 R130 R131 R132 R133 R134 R135 R136 R137 R138 R139 |
| 545 0308 120 | RES 61.9 OHM 1% 1/8W 0805 | 4 EA | R82 R84 R88 R89 |
| 545 0308 201 | RES 100 OHM 1% 1/8W 0805 | 3 EA | R1 R2 R3 |
| 545 0308 205 | RES 150 OHM 1% 1/8W 0805 | 1 EA | R63 |
| 545 0308 207 | RES 182 OHM 1% 1/8W 0805 | 1 EA | R20 |
| 545 0308 209 | RES 221 OHM 1% 1/8W 0805 | 3 EA | R67 R114 R115 |
| 545 0308 212 | RES 301 OHM 1% 1/8W 0805 | 2 EA | R26 R28 |
| 545 0308 214 | RES 357 OHM 1% 1/8W 0805 | 3 EA | R18 R21 R23 |
| 545 0308 217 | RES 475 OHM 1% 1/8W 0805 | 9 EA | R7 R8 R9 R10 R11 R12 R13 R14 R15 |
| 545 0308 221 | RES 681 OHM 1% 1/8W 0805 | 1 EA | R118 |
| 545 0308 223 | RES 825 OHM 1% 1/8W 0805 | 2 EA | R24 R29 |
| 545 0308 301 | RES 1K OHM 1% 1/8W 0805 | 11 EA | R4 R5 R38 R46 R77 R91 R92 R100 R103 R106 R108 |
| 545 0308 304 | RES 1.3K OHM 1% 1/8W 0805 | 1 EA | R73 |
| 545 0308 305 | RES 1.5K OHM 1% 1/8W 0805 | 1 EA | R109 |



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| | | | |
|---|---|---|---|
| 545 0308 308 | RES 2K OHM 1% 1/8W 0805 | 3 EA | R71 R87 R112 |
| 545 0308 311 | RES 2.67K OHM 1% 1/8W 0805 | 1 EA | R107 |
| 545 0308 312 | RES 3.01K OHM 1% 1/8W 0805 | 1 EA | R83 |
| 545 0308 313 | RES 3.32K OHM 1% 1/8W 0805 | 1 EA | R116 |
| 545 0308 322 | RES 7.5K OHM 1% 1/8W 0805 | 2 EA | R79 R81 |
| 545 0308 401 | RES 10K OHM 1% 1/8W 0805 | 21 EA | R6 R19 R22 R25 R27 R43 R65 R66 R70 R101 R102 R110 R111 R117 R120 R122 R123 R124 R125 R126 R127 |
| 545 0308 411 | RES 26.7K OHM 1% 1/8W 0805 | 2 EA | R80 R90 |
| 545 0308 416 | RES 43.2K OHM 1% 1/8W 0805 | 1 EA | R69 |
| 545 0308 501 | RES 100K OHM 1% 1/8W 0805 | 2 EA | R17 R50 |
| 545 0308 601 | RES 1M OHM 1% 1/8W 0805 | 2 EA | R72 R74 |
| 545 0308 611 | RES 2.67M OHM 1% 1/8W 0805 | 1 EA | R86 |
| 551 0017 302 | TRIMPOT 2K OHM 1/4W 4MM SQ | 1 EA | R104 |
| 551 0017 305 | TRIMPOT 5K OHM 1/4W 4MM SQ | 4 EA | R64 R78 R113 R121 |
| 551 0017 401 | TRIMPOT 10K OHM 1/4W 4MM SQ | 2 EA | R105 R119 |
| 551 0017 402 | TRIMPOT 20K OHM 1/4W 4MM SQ | 1 EA | R68 |
| 551 0017 602 | TRIMPOT 2MEG OHM 1/4W 4MM SQ | 1 EA | R76 |
| 561 0003 011 | POSISTOR 1.1 AMP 30VDC 2029 | 2 EA | R75 R85 |
| 603 0004 000 | DIPSWITCH, 8-SPST SMT-16 | 2 EA | S1 S3 |
| 604 1163 000 | SW, PB MOM SPST-NO TACT (SMT) | 1 EA | S4 |
| 604 1201 000 | SW, TOGGLE DPDT VERTICAL (SMT) | 1 EA | S2 |
| 610 1330 000 | TEST POINT, RECT-LOOP, SMT | 23 EA | TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 |
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 843 5400 771 | SCH, ACC+ | 0 DWG | |
| 843 5400 773 | PWB, ACC+ | 1 EA | |

**Table 7-11 ACC+ KIT - 992 9764 321 (D)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 253 0059 000 | CABLE, 2C 22AWG AUDIO | 15 FT | |
| 253 0095 000 | CABLE 3C 20AWG 300V | 10 FT | |
| 354 0003 000 | LUG RING #10 22-18AWG RED | 3 EA | |
| 354 0006 000 | LUG SPADE #8 22-18AWG RED | 24 EA | |
| 464 0349 000 | TOOL, ADJUSTMENT | 2 EA | |
| 542 1735 000 | RES 25 OHM 1% 10W | 2 EA | |
| 614 0505 000 | TERM BD 12 TERM | 1 EA | |
| 843 5523 792 | ACC+ AUDIO CONNECTION DIAGRAM DX | 0 DWG | |
| 917 2332 586 | CABLE, ACC INTERCONNECT | 1 EA | |
| 939 8220 414 | PANEL, ACC MOUNTING | 1 EA | |
| 992 9764 319 | ACC+ BOARD | 1 EA | |

**Table 7-12 CABLE, ACC INTERCONNECT - 917 2332 586 (A)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 296 0253 000 | TUBING, SHRINK 3/16 WHITE | 0.4 FT | |
| 618 0705 000 | *COAX, RG-316 | 5.1 FT | |
| 620 1913 000 | PLUG, BNC STRT CABLE | 2 EA | |
| 817 2332 586 | ASSY INST ACC INTERCONNECT | 0 DWG | |

**Table 7-13 ACC+ BOARD - 992 9764 319 (B--)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 917 2332 718 | FIRMWARE, ACC+ | 1 EA | U9 U10 |
| 988 2509 002 | DOC PKG, ACC + | 1 EA | |



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| | | | |
|---|---|---|---|
| 992 9511 413 | PWA, ACC+ | 1 EA | |

**Table 7-14 PWA, ACC+ - 992 9511 413 (F)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 404 0908 000 | *HEATSINK, VERTICAL, TO-220 | 3 EA | XU18 XU26 XU33 |
| 522 0588 000 | CAP 100UF 25V 20% 8MM NON-POLAR | 1 EA | C130 |
| 610 1069 000 | HDR, 9C 1ROW VERTICAL UNSHR | 1 EA | J99 |
| 612 1184 000 | JUMPER SHUNT, 2C, 0.1" PITCH | 5 EA | XJP1 XJP2 XJP3 XJP4 XJP5 |
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 817 2551 014 | PROGRAMMING INSTR, ACC/DELAY | 0 DWG | #U16 |
| 614 0953 005 | *TERMINAL STRIP, 6 TERM | 1 EA | J1 |
| 620 1677 000 | JACK, BNC STRAIGHT PCB | 1 EA | J2 |
| 614 0909 000 | TERM BLK, PCB, 3-POLE, GREY (237) | 7 EA | J3 J4 J5 J6 J7 J8 J10 |
| 614 0953 006 | *TERMINAL STRIP, 12 TERM | 1 EA | J9 |
| 610 0900 000 | HDR, 3C VERT 1ROW UNSHR | 5 EA | JP1 JP2 JP3 JP4 JP5 |
| 492 0881 000 | CHOKE, 10MH 20% 89MA RADIAL | 2 EA | L1 L2 |
| 382 1633 000 | IC, LT1033 ESD | 1 EA | U33 |
| 382 1328 000 | IC, 1085 ESD | 1 EA | U18 |
| 382 0184 000 | *IC, LM340A/LM7805AC (TO-220) | 1 EA | U26 |
| 566 0037 000 | CONVERTER, DC/DC 5V .75W ESD | 1 EA | U3 |
| 992 9511 414 | PWA, ACC+ SMT | 1 EA | |
| 843 5400 771 | SCH, ACC+ | 0 DWG | |

**Table 7-15 PWA, ACC+ SMT - 992 9511 414 (D)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 381 0029 000 | N-MOSFET, 2N7002 | 2 EA | Q1 Q2 |
| 383 0062 000 | IC, HI5741 ESD | 2 EA | U13 U24 |
| 383 0126 000 | IC, MAX705/ADM705 (SOIC-08) | 1 EA | U17 |
| 383 0140 000 | IC, DG419 SPDT SWITCH ESD | 3 EA | U29 U35 U36 |
| 383 0244 000 | IC, ILD206 | 5 EA | U4 U5 U6 U7 U8 |
| 383 0422 000 | IC 74HCT273 ESD | 4 EA | U11 U12 U22 U23 |
| 383 0431 000 | IC OPA2227 ESD | 8 EA | U19 U28 U30 U31 U34 U37 U38 U39 |
| 383 0432 000 | IC MAX 902 ESD | 1 EA | U1 |
| 383 0443 000 | IC LTC1414C ESD | 2 EA | U14 U15 |
| 383 0444 000 | *IC, MIC2940 (TO-263) | 1 EA | U2 |
| 383 0445 000 | IC, AD620 | 1 EA | U21 |
| 383 0446 000 | IC AD847 ESD | 1 EA | U25 |
| 383 0475 000 | IC 74HCT14 ESD | 1 EA | U27 |
| 383 0488 000 | IC, LM337 (D2PAK) | 1 EA | U32 |
| 383 0663 000 | IC, 72V265 ESD | 1 EA | U20 |
| 385 0001 000 | *DIODE, RECT MMBD4148/914 ESD | 20 EA | CR3 CR4 CR5 CR6 CR7 CR8 CR9 CR10 CR11 CR12 CR13 CR14 CR15 CR16 CR17 CR18 CR19 CR20 CR23 CR24 |
| 385 0008 000 | DIODE, SCHOTTKY 10MQ040N ESD | 3 EA | CR22 CR25 CR26 |
| 385 0012 000 | *DIODE, SCHOTTKY MBR0520 | 4 EA | CR1 CR2 CR21 CR27 |
| 389 0004 102 | LED, GRN, 2.4MM ROUND ESD | 5 EA | DS2 DS3 DS4 DS5 DS6 |
| 389 0004 103 | LED, YEL, 2.4MM ROUND ESD | 1 EA | DS1 |
| 389 0010 001 | LED, RED 0805 DIFFUSED ESD | 1 EA | DS7 |
| 393 0086 000 | *CPLD, XC9536XL (QFP-44) | 1 EA | U16 |
| 404 0869 000 | SOCKET, PLCC-32, SMT | 2 EA | XU9 XU10 |
| 496 0095 000 | INDUCTOR 33UH +/-20% SMT | 2 EA | L3 L4 |
| 496 0114 000 | IND, POWER 250UH 20% | 1 EA | T1 |
| 515 0134 205 | *CAP 150PF 0805 C0G 100V 5% | 2 EA | C98 C105 |
| 515 0134 209 | *CAP 220PF 0805 C0G 100V 5% | 2 EA | C59 C60 |
| 515 0134 213 | *CAP 330PF 0805 C0G 100V 5% | 2 EA | C80 C84 |
| 515 0134 217 | *CAP 470PF 0805 C0G 100V 5% | 4 EA | C36 C40 C41 C73 |



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| | | | |
|---|---|---|---|
| 515 0135 301 | *CAP 1000PF 1206 C0G 100V 5% | 2 EA | C77 C88 |
| 515 0136 401 | *CAP 0.01UF 0805 X7R 100V 10% | 1 EA | C127 |
| 515 0136 501 | *CAP 0.1UF 0805 X7R 50V 10% | 82 EA | C1 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C14 C18 C19 C20 C23 C24 C25 C26 C31 C32 C33 C34 C35 C37 C38 C39 C42 C43 C44 C45 C46 C47 C52 C55 C56 C63 C64 C66 C67 C68 C69 C70 C74 C75 C76 C78 C81 C82 C83 C85 C86 C87 C89 C90 C91 C92 C93 C94 C95 C96 C97 C100 C101 C102 C103 C106 C107 C109 C110 C111 C113 C115 C116 C117 C118 C119 C120 C123 C126 C128 C129 |
| 515 0137 601 | CAP 1UF 1206 X7R 25V 10% | 1 EA | C49 |
| 515 0139 601 | *CAP 1UF 1812 Z5U 50V 20% | 2 EA | C65 C71 |
| 523 0001 201 | CAP 100UF 6.3V 20% SMT | 18 EA | C13 C15 C16 C17 C21 C22 C27 C28 C29 C30 C50 C53 C54 C57 C58 C62 C79 C108 |
| 523 0002 201 | CAP 100UF 25V 20% 8MM 105C | 6 EA | C72 C114 C121 C122 C124 C125 |
| 523 0003 101 | CAP 10UF 35V 20% SMT | 7 EA | C2 C48 C51 C61 C99 C104 C112 |
| 540 1568 000 | RES NTWK 10K OHM 5% BUSS | 2 EA | R16 R30 |
| 545 0308 109 | RES 22.1 OHM 1% 1/8W 0805 | 35 EA | R31 R32 R33 R34 R35 R36 R37 R39 R40 R41 R42 R44 R45 R47 R48 R49 R51 R52 R53 R54 R55 R56 R57 R58 R59 R60 R61 R62 R93 R94 R95 R96 R97 R98 R99 |
| 545 0308 115 | RES 39.2 OHM 1% 1/8W 0805 | 12 EA | R128 R129 R130 R131 R132 R133 R134 R135 R136 R137 R138 R139 |
| 545 0308 120 | RES 61.9 OHM 1% 1/8W 0805 | 4 EA | R82 R84 R88 R89 |
| 545 0308 201 | RES 100 OHM 1% 1/8W 0805 | 3 EA | R1 R2 R3 |
| 545 0308 205 | RES 150 OHM 1% 1/8W 0805 | 1 EA | R63 |
| 545 0308 207 | RES 182 OHM 1% 1/8W 0805 | 1 EA | R20 |
| 545 0308 209 | RES 221 OHM 1% 1/8W 0805 | 3 EA | R67 R114 R115 |
| 545 0308 212 | RES 301 OHM 1% 1/8W 0805 | 2 EA | R26 R28 |
| 545 0308 214 | RES 357 OHM 1% 1/8W 0805 | 3 EA | R18 R21 R23 |
| 545 0308 217 | RES 475 OHM 1% 1/8W 0805 | 9 EA | R7 R8 R9 R10 R11 R12 R13 R14 R15 |
| 545 0308 221 | RES 681 OHM 1% 1/8W 0805 | 1 EA | R118 |
| 545 0308 223 | RES 825 OHM 1% 1/8W 0805 | 2 EA | R24 R29 |
| 545 0308 301 | RES 1K OHM 1% 1/8W 0805 | 11 EA | R4 R5 R38 R46 R77 R91 R92 R100 R103 R106 R108 |
| 545 0308 304 | RES 1.3K OHM 1% 1/8W 0805 | 1 EA | R73 |
| 545 0308 305 | RES 1.5K OHM 1% 1/8W 0805 | 1 EA | R109 |
| 545 0308 308 | RES 2K OHM 1% 1/8W 0805 | 3 EA | R71 R87 R112 |
| 545 0308 311 | RES 2.67K OHM 1% 1/8W 0805 | 1 EA | R107 |
| 545 0308 312 | RES 3.01K OHM 1% 1/8W 0805 | 1 EA | R83 |
| 545 0308 313 | RES 3.32K OHM 1% 1/8W 0805 | 1 EA | R116 |
| 545 0308 322 | RES 7.5K OHM 1% 1/8W 0805 | 2 EA | R79 R81 |
| 545 0308 401 | RES 10K OHM 1% 1/8W 0805 | 21 EA | R6 R19 R22 R25 R27 R43 R65 R66 R70 R101 R102 R110 R111 R117 R120 R122 R123 R124 R125 R126 R127 |
| 545 0308 411 | RES 26.7K OHM 1% 1/8W 0805 | 2 EA | R80 R90 |
| 545 0308 416 | RES 43.2K OHM 1% 1/8W 0805 | 1 EA | R69 |



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| | | | |
|---|---|---|---|
| 545 0308 501 | RES 100K OHM 1% 1/8W 0805 | 2 EA | R17 R50 |
| 545 0308 601 | RES 1M OHM 1% 1/8W 0805 | 2 EA | R72 R74 |
| 545 0308 611 | RES 2.67M OHM 1% 1/8W 0805 | 1 EA | R86 |
| 551 0017 302 | TRIMPOT 2K OHM 1/4W 4MM SQ | 1 EA | R104 |
| 551 0017 305 | TRIMPOT 5K OHM 1/4W 4MM SQ | 4 EA | R64 R78 R113 R121 |
| 551 0017 401 | TRIMPOT 10K OHM 1/4W 4MM SQ | 2 EA | R105 R119 |
| 551 0017 402 | TRIMPOT 20K OHM 1/4W 4MM SQ | 1 EA | R68 |
| 551 0017 602 | TRIMPOT 2MEG OHM 1/4W 4MM SQ | 1 EA | R76 |
| 561 0003 011 | POSISTOR 1.1 AMP 30VDC 2029 | 2 EA | R75 R85 |
| 603 0004 000 | DIPSWITCH, 8-SPST SMT-16 | 2 EA | S1 S3 |
| 604 1163 000 | SW, PB MOM SPST-NO TACT (SMT) | 1 EA | S4 |
| 604 1201 000 | SW, TOGGLE DPDT VERTICAL (SMT) | 1 EA | S2 |
| 610 1330 000 | TEST POINT, RECT-LOOP, SMT | 23 EA | TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 |
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 843 5400 771 | SCH, ACC+ | 0 DWG | |
| 843 5400 773 | PWB, ACC+ | 1 EA | |

**Table 7-16 OPT #5, ACC W/ENHANCED EXT I/O - 992 7285 064 (E)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 302 0108 000 | SCR, 6-32 X 1/2 | 10 EA | |
| 310 0012 000 | WASHER, FLAT #6 SST (ANSI NARROW) | 10 EA | |
| 314 0005 000 | LOCKWASHER, SPLIT #6 SST (ANSI) | 10 EA | |
| 620 0124 000 | ADAPTER, BNC-JACK TO BNC-PLUG | 2 EA | |
| 813 5000 011 | STDOFF 6-32X1 5/16 HEX | 4 EA | |
| 813 5604 008 | STUD BRS 6-32 X 13/16 | 4 EA | |
| 917 2517 339 | CABLE KIT, ACC 3DX50 | 1 EA | |
| 939 8220 450 | PLATE, ACC BOARD | 1 EA | |
| 992 7285 061 | OPT #4, ENHANCED EXT I/O PKG | 1 EA | |
| 992 9764 319 | ACC+ BOARD | 1 EA | 3A4A9 |

**Table 7-17 PLATE, ACC BOARD - 939 8220 450 (A)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 001 5010 060 | SHEET, ALUM 0.063 THK (5052-H32) | 0.3931 LB | |
| 839 8220 450 | FAB INSTRU, PLATE MTG | 0 DWG | |
| 358 1732 000 | STANDOFF, PEM 6-32 X 0.5 (SOS-632-16) | 6 EA | |

**Table 7-18 OPT #4, ENHANCED EXT I/O PKG - 992 7285 061 (B)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 612 2156 012 | PLUG, 12C 1ROW VERTICAL | 9 EA | |
| 988 2509 001 | DOC PKG, ENHANCED EXT I/O | 1 EA | |
| 992 7220 113 | PWA, ENHANCED EXTERNAL I/O | 1 EA | 3A5 |

**Table 7-19 DOC PKG, ENHANCED EXT I/O - 988 2509 001 (A)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 888 2509 001 | TM ENHANCED EXT I/O OPTION | 1 EA | |
| 917 2517 354 | SCH PKG, ENHANCED EXT I/O | 1 EA | |

**Table 7-20 SCH PKG, ENHANCED EXT I/O - 917 2517 354 (A)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 843 5513 901 | SCH, ENHANCED EXTERNAL I/O | 0 DWG | |

**Table 7-21 PWA, ENHANCED EXTERNAL I/O - 992 7220 113 (G--)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 055 0100 005 | *THERMAL COMPOUND, 8OZ JAR | 0 EA | Q4 |
| 086 0001 010 | *SEALANT, GLYPTOL, RED | 0 QT | J22 |
| 300 1485 000 | SCREW, PHMS 4-40 X 5/16 BRASS | 1 EA | 1/Q4 |
| 304 0087 000 | NUT, HEX 4-40 | 1 EA | 1/Q4 |
| 308 0003 000 | *WASHER, FLAT #4 BRASS (ANSI NARROW) | 1 EA | 1/Q4 |
| 312 0045 000 | LOCKWASHER, SPLIT #4 PH-BRZ (ANSI) | 1 EA | 1/Q4 |
| 357 0033 000 | SCREW 4-40 X .375 BHMS | 2 EA | 2/J22 |
| 384 0935 000 | *SCR, S6055R ESD | 1 EA | Q4 |
| 492 0881 000 | CHOKE, 10MH 20% 89MA RADIAL | 2 EA | L2 L3 |
| 516 0419 000 | CAP DISC 0.05UF 500V -20/+80% | 2 EA | C5 C8 |
| 560 0122 022 | POSISTOR 4 AMP 30VDC RECT DISC | 1 EA | R295 |
| 566 0037 000 | CONVERTER, DC/DC 5V .75W ESD | 3 EA | U24 U26 U28 |
| 578 0026 000 | RELAY 2PDT 12VDC 2A NON-LATCH | 5 EA | K1 K2 K3 K4 K5 |
| 610 0877 000 | HDR, 2C VERT 1ROW UNSHR | 10 EA | JP1 JP2 JP3 JP4 JP5 JP6 JP12 JP15 JP16 JP17 |
| 610 0900 000 | HDR, 3C VERT 1ROW UNSHR | 2 EA | JP7 JP8 |
| 610 1069 000 | HDR, 9C 1ROW VERTICAL UNSHR | 1 EA | J19 |
| 610 1070 000 | HDR, 6C VERT 2ROW UNSHR | 1 EA | JP14 |
| 610 1083 000 | PLUG, 'D', 37C VERT PCB PLASTIC | 1 EA | J22 |
| 610 1106 000 | HDR, 8C VERT 1ROW FRICTION | 1 EA | J9 |
| 610 1107 000 | HDR, 12C VERT 1ROW FRICTION | 2 EA | J16 J17 |
| 610 1110 000 | HDR, 8C VERT 2ROW UNSHR | 4 EA | JP9 JP10 JP11 JP13 |
| 610 1287 000 | <*>HDR, 20C 2ROW VERTICAL (SYS 50) | 1 EA | J8 |
| 610 1360 000 | <*>HDR, 50C 2ROW VERTICAL (SYS 50) | 2 EA | J2 J3 |
| 610 1423 012 | HDR, 12C 1ROW VERTICAL | 9 EA | J18 J20 J21 J23 J24 J25 J26 J27 J28 |
| 612 1184 000 | JUMPER SHUNT, 2C, 0.1" PITCH | 17 EA | XJP1 XJP2 XJP3 XJP4 XJP5 XJP6 XJP7 XJP8 XJP9 XJP10 XJP11 XJP12 XJP13 XJP14 XJP15 XJP16 XJP17 |
| 620 0700 000 | JACK RECP, SMB PCB MT VERTICAL | 7 EA | J1 J4 J5 J6 J11 J13 J14 |
| 620 1677 000 | JACK, BNC STRAIGHT PCB | 4 EA | J7 J10 J12 J15 |
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 817 2517 336 | SW/FW,3DX50_ENHANCED EXT I/O | 0 DWG | |
| 843 5513 901 | SCH, ENHANCED EXTERNAL I/O | 0 DWG | |
| 992 7220 114 | *PWA, ENHANCED EXT I/O, SMT | 1 EA | |

**Table 7-22 *PWA, ENHANCED EXT I/O, SMT - 992 7220 114 (J--)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 000 0000 010 | B/M NOTE: | 2 DWG | CR2 CR6 |
| 381 0027 000 | FET, SI9435BDY | 1 EA | Q9 |
| 381 0029 000 | N-MOSFET, 2N7002 | 40 EA | Q1 Q2 Q3 Q5 Q6 Q7 Q8 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 Q25 Q26 Q27 Q28 Q29 Q30 Q31 Q32 Q33 Q34 Q35 Q36 Q37 Q38 Q39 Q40 Q41 Q42 |
| 382 1392 000 | *IC, LM324 (SOIC-14) | 4 EA | U9 U13 U16 U19 |
| 382 1428 000 | <*>IC, CS8412 (SOIC-28) | 1 EA | Ui |
| 383 0148 000 | IC, 74HC14 (SOIC-14) | 6 EA | U22 U25 U27 U30 U32 U36 |
| 383 0150 000 | <*>IC, 74HC04 | 1 EA | U8 |
| 383 0244 000 | IC, ILD206 | 18 EA | U7 U29 U31 U33 U34 U35 U37 U38 U39 U40 U41 U42 U43 U44 U45 U46 U47 U48 |
| 383 0373 000 | IC, MAX485/ADM483 (SOIC-8) | 2 EA | U15 U20 |
| 383 0431 000 | IC OPA2227 ESD | 3 EA | U6 U10 U11 |



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| | | | |
|---|---|---|---|
| 383 0444 000 | *IC, MIC2940 (TO-263) | 1 EA | U23 |
| 383 0445 000 | IC, AD620 | 1 EA | U3 |
| 383 0463 000 | IC LM2675 ESD | 1 EA | U18 |
| 383 0467 000 | IC, 7114/4429 ESD | 1 EA | U2 |
| 383 0468 000 | IC, ADG419 | 1 EA | U12 |
| 383 0486 000 | IC MC3423 ESD | 1 EA | U21 |
| 383 0587 000 | IC, CS4390 ESD | 1 EA | U4 |
| 383 0601 000 | IC, THS4151 ESD | 1 EA | U5 |
| 383 0608 000 | IC, XR2206 ESD | 1 EA | U14 |
| 385 0001 000 | *DIODE, RECT MMBD4148/914 ESD | 41 EA | CR1 CR5 CR12 CR26 CR27 CR28 CR29 CR30 CR31 CR41 CR43 CR45 CR46 CR47 CR48 CR49 CR51 CR52 CR53 CR54 CR56 CR57 CR58 CR60 CR62 CR64 CR66 CR68 CR70 CR72 CR73 CR74 CR75 CR76 CR77 CR78 CR79 CR80 CR81 CR82 CR83 |
| 385 0011 000 | DIODE, SCHOTTKY MBRS340 | 1 EA | CR20 |
| 385 0012 000 | *DIODE, SCHOTTKY MBR0520 | 4 EA | CR3 CR4 CR8 CR9 |
| 387 0001 006 | DIODE, TVS (UNIDIR), SMBJ5.0A ESD | 12 EA | CR13 CR14 CR15 CR16 CR17 CR18 CR19 CR21 CR22 CR23 CR24 CR25 |
| 387 0001 024 | DIODE, TVS (UNIDIR), SMBJ30A | 17 EA | CR34 CR35 CR36 CR37 CR39 CR40 CR42 CR44 CR50 CR55 CR59 CR61 CR63 CR65 CR67 CR69 CR71 |
| 387 0002 013 | DIODE, TVS (UNIDIR), SMCJ10A | 2 EA | CR7 CR11 |
| 387 0003 006 | ZENER MMSZ5231B 5.1V 5% 0.5W | 1 EA | CR84 |
| 387 0007 013 | DIODE, TVS (BIDIR), SMBJ10CA | 1 EA | CR10 |
| 387 0007 024 | DIODE, TVS (BIDIR), SMBJ30CA | 2 EA | CR32 CR38 |
| 387 0010 026 | DIODE, TVS (BIDIR), SMCJ36CA | 1 EA | CR33 |
| 389 0010 001 | LED, RED 0805 DIFFUSED ESD | 10 EA | DS1 DS2 DS3 DS4 DS5 DS7 DS9 DS11 DS13 DS15 |
| 389 0010 002 | LED, GREEN 0805 DIFFUSED ESD | 3 EA | DS12 DS14 DS16 |
| 389 0010 004 | LED, ORANGE 0805 DIFFUSED ESD | 3 EA | DS6 DS8 DS10 |
| 393 0072 000 | *CPLD, XC9572XL (QFP-64) | 1 EA | U17 |
| 445 0022 000 | OSC, 6.1440MHZ SMT | 1 EA | Y1 |
| 478 0428 000 | XFMR, RF, 0.05-200MHZ | 1 EA | T2 |
| 484 0468 000 | FILTER, T-TYPE FERRITE EMI,SMT | 45 EA | FL1 FL2 FL3 FL4 FL5 FL6 FL7 FL8 FL9 FL10 FL11 FL12 FL13 FL14 FL15 FL16 FL17 FL18 FL19 FL20 FL21 FL22 FL23 FL24 FL25 FL26 FL27 FL28 FL29 FL30 FL31 FL32 FL33 FL34 FL35 FL36 FL37 FL38 FL39 FL40 FL41 FL42 FL43 FL44 FL45 |
| 494 0487 000 | <*>IND, PWR 100UH 10% 5MM SMT | 1 EA | L1 |
| 496 0095 000 | INDUCTOR 33UH +/-20% SMT | 3 EA | L4 L5 L6 |
| 496 0114 000 | IND, POWER 250UH 20% | 1 EA | T1 |
| 515 0134 117 | *CAP 47PF 0805 C0G 100V 5% | 2 EA | C17 C40 |
| 515 0134 209 | *CAP 220PF 0805 C0G 100V 5% | 5 EA | C23 C31 C36 C48 C58 |
| 515 0135 301 | *CAP 1000PF 1206 C0G 100V 5% | 4 EA | C25 C37 C42 C45 |
| 515 0135 317 | CAP 4700PF 1206 C0G 100V 5% | 1 EA | C80 |
| 515 0136 301 | *CAP 1000PF 0805 X7R 100V 10% | 16 EA | C51 C52 C55 C56 C59 C60 C66 C71 C83 C84 C87 C88 C96 C97 C99 C100 |
| 515 0136 401 | *CAP 0.01UF 0805 X7R 100V 10% | 1 EA | C92 |
| 515 0136 417 | *CAP 0.047UF 0805 X7R 100V 10% | 1 EA | C10 |



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| | | | |
|---|---|---|---|
| 515 0136 501 | *CAP 0.1UF 0805 X7R 50V 10% | 13 EA | C9 C15 C18 C19 C26 C28 C35 C38 C63 C65 C69 C70 C72 |
| 515 0137 501 | *CAP 0.1UF 1206 X7R 50V 10% | 97 EA | C3 C4 C11 C16 C27 C29 C32 C39 C47 C49 C57 C61 C64 C67 C77 C78 C81 C82 C85 C90 C91 C93 C94 C102 C103 C104 C105 C106 C107 C111 C112 C113 C115 C116 C117 C118 C119 C121 C125 C126 C128 C132 C134 C136 C137 C138 C140 C141 C142 C144 C145 C146 C147 C148 C149 C150 C151 C152 C153 C154 C155 C156 C157 C158 C159 C160 C161 C162 C163 C164 C165 C166 C167 C168 C169 C170 C171 C172 C173 C174 C175 C176 C177 C178 C179 C180 C181 C182 C183 C184 C185 C186 C187 C189 C190 C191 C192 |
| 515 0137 517 | CAP 0.47UF 5% 25V 1206 X7R | 1 EA | C108 |
| 515 0138 509 | CAP 0.22UF 1812 X7R 100V 10% | 2 EA | C98 C101 |
| 515 0138 601 | CAP 1UF 1812 X7R 50V 10% | 20 EA | C6 C7 C13 C14 C20 C21 C22 C30 C34 C41 C43 C46 C54 C62 C68 C73 C74 C76 C79 C131 |
| 523 0001 117 | CAP, 47UF 6.3V 20% SMT | 1 EA | C109 |
| 523 0001 201 | CAP 100UF 6.3V 20% SMT | 3 EA | C123 C127 C133 |
| 523 0002 117 | CAP 47UF 25V 20% 6.3MM | 6 EA | C124 C129 C130 C135 C139 C143 |
| 523 0003 101 | CAP 10UF 35V 20% SMT | 14 EA | C1 C2 C12 C24 C33 C44 C50 C53 C75 C110 C114 C122 C188 C193 |
| 523 0004 101 | CAP 10UF 50V 20% SMT | 1 EA | C120 |
| 526 0396 000 | CAP, 68UF 25V 20% SMT 0.28 | 3 EA | C86 C89 C95 |
| 540 1568 000 | RES NTWK 10K OHM 5% BUSS | 4 EA | R222 R225 R270 R279 |
| 545 0308 109 | RES 22.1 OHM 1% 1/8W 0805 | 5 EA | R11 R21 R54 R245 R249 |
| 545 0308 201 | RES 100 OHM 1% 1/8W 0805 | 2 EA | R138 R139 |
| 545 0308 212 | RES 301 OHM 1% 1/8W 0805 | 2 EA | R1 R12 |
| 545 0308 213 | RES 332 OHM 1% 1/8W 0805 | 16 EA | R35 R198 R206 R214 R223 R231 R238 R246 R253 R258 R262 R266 R271 R275 R278 R280 |
| 545 0308 217 | RES 475 OHM 1% 1/8W 0805 | 61 EA | R32 R50 R55 R56 R61 R76 R83 R90 R94 R95 R98 R100 R102 R105 R107 R111 R112 R115 R120 R123 R125 R127 R133 R134 R137 R148 R149 R152 R154 R156 R158 R160 R162 R165 R171 R173 R176 R179 R188 R189 R201 R205 R209 R213 R219 R226 R230 R234 R237 R241 R242 R252 R255 R257 R264 R268 R274 R277 R283 R288 R290 |
| 545 0308 218 | RES 511 OHM 1% 1/8W 0805 | 2 EA | R66 R285 |
| 545 0308 219 | RES 562 OHM 1% 1/8W 0805 | 6 EA | R106 R110 R113 R116 R119 R126 |
| 545 0308 301 | RES 1K OHM 1% 1/8W 0805 | 22 EA | R93 R96 R99 R109 R118 R124 R144 R150 R153 R155 R157 R163 R166 R167 R180 R183 |

| | | | |
|---|---|---|---|
| | | | R184 R197 R204 R217 R220 R227 |
| 545 0308 312 | RES 3.01K OHM 1% 1/8W 0805 | 1 EA | R74 |
| 545 0308 315 | RES 3.92K OHM 1% 1/8W 0805 | 1 EA | R73 |
| 545 0308 317 | RES 4.75K OHM 1% 1/8W 0805 | 1 EA | R72 |
| 545 0308 318 | RES 5.11K OHM 1% 1/8W 0805 | 2 EA | R60 R65 |
| 545 0308 401 | RES 10K OHM 1% 1/8W 0805 | 44 EA | R3 R6 R8 R27 R28 R40 R42 R71 R75 R82 R85 R86 R89 R91 R129 R131 R141 R147 R151 R170 R172 R177 R181 R185 R186 R191 R195 R202 R210 R211 R218 R228 R239 R247 R254 R259 R260 R263 R267 R272 R276 R281 R282 R284 |
| 545 0308 404 | RES 13K OHM 1% 1/8W 0805 | 2 EA | R33 R142 |
| 545 0308 405 | RES 15K OHM 1% 1/8W 0805 | 1 EA | R70 |
| 545 0308 406 | RES 16.2K OHM 1% 1/8W 0805 | 1 EA | R80 |
| 545 0308 407 | RES 18.2K OHM 1% 1/8W 0805 | 1 EA | R69 |
| 545 0308 408 | RES 20K OHM 1% 1/8W 0805 | 11 EA | R79 R136 R159 R161 R164 R175 R178 R187 R233 R287 R289 |
| 545 0308 409 | RES 22.1K OHM 1% 1/8W 0805 | 1 EA | R68 |
| 545 0308 411 | RES 26.7K OHM 1% 1/8W 0805 | 1 EA | R78 |
| 545 0308 413 | RES 33.2K OHM 1% 1/8W 0805 | 1 EA | R64 |
| 545 0308 416 | RES 43.2K OHM 1% 1/8W 0805 | 1 EA | R63 |
| 545 0308 417 | RES 47.5K OHM 1% 1/8W 0805 | 6 EA | R44 R47 R48 R49 R52 R53 |
| 545 0308 418 | RES 51.1K OHM 1% 1/8W 0805 | 3 EA | R62 R145 R146 |
| 545 0308 601 | RES 1M OHM 1% 1/8W 0805 | 2 EA | R13 R36 |
| 545 0309 101 | RES 10 OHM 1% 1/4W 1206 | 36 EA | R4 R7 R39 R51 R57 R67 R84 R87 R97 R101 R104 R108 R114 R117 R122 R130 R132 R135 R143 R168 R174 R182 R190 R193 R199 R207 R215 R224 R235 R243 R250 R256 R261 R265 R269 R273 |
| 545 0309 202 | RES 110 OHM 1% 1/4W 1206 | 1 EA | R20 |
| 545 0309 203 | RES 121 OHM 1% 1/4W 1206 | 2 EA | R103 R121 |
| 545 0309 208 | RES 200 OHM 1% 1/4W 1206 | 1 EA | R81 |
| 545 0309 215 | RES 392 OHM 1% 1/4W 1206 | 4 EA | R14 R17 R22 R23 |
| 545 0309 224 | RES 909 OHM 1% 1/4W 1206 | 16 EA | R192 R194 R196 R200 R203 R208 R212 R216 R221 R229 R232 R236 R240 R244 R248 R251 |
| 545 0309 301 | RES 1K OHM 1% 1/4W 1206 | 1 EA | R5 |
| 545 0309 313 | RES 3.32K OHM 1% 1/4W 1206 | 4 EA | R19 R30 R31 R45 |
| 545 0309 401 | RES 10K OHM 1% 1/4W 1206 | 5 EA | R9 R24 R77 R88 R128 |
| 545 0309 404 | RES 13K OHM 1% 1/4W 1206 | 8 EA | R15 R18 R26 R29 R37 R38 R41 R46 |
| 545 0309 508 | RES 200K OHM 1% 1/4W 1206 | 1 EA | R92 |
| 545 0310 118 | RES 51.1 OHM 1% 1W 2512 | 3 EA | R2 R10 R43 |
| 551 0017 402 | TRIMPOT 20K OHM 1/4W 4MM SQ | 1 EA | R58 |
| 551 0017 405 | TRIMPOT 50K OHM 1/4W 4MM SQ | 1 EA | R59 |
| 551 0017 601 | TRIMPOT 1MEG OHM 1/4W 4MM SQ | 1 EA | R34 |
| 561 0003 005 | POSISTOR 0.3 AMP 60VDC 2029 | 1 EA | R286 |
| 561 0003 007 | POSISTOR 0.5 AMP 60VDC 2029 | 4 EA | R16 R25 R140 R169 |
| 561 0003 011 | POSISTOR 1.1 AMP 30VDC 2029 | 4 EA | R291 R292 R293 R294 |
| 603 0003 000 | DIPSWITCH, 2-SPST SMT-4 | 1 EA | S2 |
| 604 1163 000 | SW, PB MOM SPST-NO TACT (SMT) | 1 EA | S1 |
| 610 1330 000 | TEST POINT, RECT-LOOP, SMT | 9 EA | TP1 TP2 TP3 TP4 TP8 TP9 TP10 TP11 TP12 |



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| | | | |
|---|---|---|---|
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 843 5513 901 | SCH, ENHANCED EXTERNAL I/O | 0 DWG | |
| 843 5513 903 | PWB, ENHANCED EXTERNAL I/O | 1 EA | |

**Table 7-23 ACC+ BOARD - 992 9764 319 (B--)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 917 2332 718 | FIRMWARE, ACC+ | 1 EA | U9 U10 |
| 988 2509 002 | DOC PKG, ACC + | 1 EA | |
| 992 9511 413 | PWA, ACC+ | 1 EA | |

**Table 7-24 FIRMWARE, ACC+ - 917 2332 718 (A)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 393 0054 000 | IC, AT29LV010A (PLCC-32) | 2 EA | U9 U10 |
| 817 2332 718 | PROGRAMMING INSTRUCTION, ACC+ | 0 DWG | |

**Table 7-25 PWA, ACC+ - 992 9511 413 (F)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 404 0908 000 | *HEATSINK, VERTICAL, TO-220 | 3 EA | XU18 XU26 XU33 |
| 522 0588 000 | CAP 100UF 25V 20% 8MM NON-POLAR | 1 EA | C130 |
| 610 1069 000 | HDR, 9C 1ROW VERTICAL UNSHR | 1 EA | J99 |
| 612 1184 000 | JUMPER SHUNT, 2C, 0.1" PITCH | 5 EA | XJP1 XJP2 XJP3 XJP4 XJP5 |
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 817 2551 014 | PROGRAMMING INSTR, ACC/DELAY | 0 DWG | #U16 |
| 614 0953 005 | *TERMINAL STRIP, 6 TERM | 1 EA | J1 |
| 620 1677 000 | JACK, BNC STRAIGHT PCB | 1 EA | J2 |
| 614 0909 000 | TERM BLK, PCB, 3-POLE, GREY (237) | 7 EA | J3 J4 J5 J6 J7 J8 J10 |
| 614 0953 006 | *TERMINAL STRIP, 12 TERM | 1 EA | J9 |
| 610 0900 000 | HDR, 3C VERT 1ROW UNSHR | 5 EA | JP1 JP2 JP3 JP4 JP5 |
| 492 0881 000 | CHOKE, 10MH 20% 89MA RADIAL | 2 EA | L1 L2 |
| 382 1633 000 | IC, LT1033 ESD | 1 EA | U33 |
| 382 1328 000 | IC, 1085 ESD | 1 EA | U18 |
| 382 0184 000 | *IC, LM340A/LM7805AC (TO-220) | 1 EA | U26 |
| 566 0037 000 | CONVERTER, DC/DC 5V .75W ESD | 1 EA | U3 |
| 992 9511 414 | PWA, ACC+ SMT | 1 EA | |
| 843 5400 771 | SCH, ACC+ | 0 DWG | |

**Table 7-26 PWA, ACC+ SMT - 992 9511 414 (D)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 381 0029 000 | N-MOSFET, 2N7002 | 2 EA | Q1 Q2 |
| 383 0062 000 | IC, HI5741 ESD | 2 EA | U13 U24 |
| 383 0126 000 | IC, MAX705/ADM705 (SOIC-08) | 1 EA | U17 |
| 383 0140 000 | IC, DG419 SPDT SWITCH ESD | 3 EA | U29 U35 U36 |
| 383 0244 000 | IC, ILD206 | 5 EA | U4 U5 U6 U7 U8 |
| 383 0422 000 | IC 74HCT273 ESD | 4 EA | U11 U12 U22 U23 |
| 383 0431 000 | IC OPA2227 ESD | 8 EA | U19 U28 U30 U31 U34 U37 U38 U39 |
| 383 0432 000 | IC MAX 902 ESD | 1 EA | U1 |
| 383 0443 000 | IC LTC1414C ESD | 2 EA | U14 U15 |
| 383 0444 000 | *IC, MIC2940 (TO-263) | 1 EA | U2 |
| 383 0445 000 | IC, AD620 | 1 EA | U21 |
| 383 0446 000 | IC AD847 ESD | 1 EA | U25 |
| 383 0475 000 | IC 74HCT14 ESD | 1 EA | U27 |
| 383 0488 000 | IC, LM337 (D2PAK) | 1 EA | U32 |
| 383 0663 000 | IC, 72V265 ESD | 1 EA | U20 |
| 385 0001 000 | *DIODE, RECT MMBD4148/914 ESD | 20 EA | CR3 CR4 CR5 CR6 CR7 CR8 CR9 CR10 CR11 CR12 CR13 |



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| | | | |
|---|---|---|---|
| | | | CR14 CR15 CR16 CR17 CR18 CR19 CR20 CR23 CR24 |
| 385 0008 000 | DIODE, SCHOTTKY 10MQ040N ESD | 3 EA | CR22 CR25 CR26 |
| 385 0012 000 | *DIODE, SCHOTTKY MBR0520 | 4 EA | CR1 CR2 CR21 CR27 |
| 389 0004 102 | LED, GRN, 2.4MM ROUND ESD | 5 EA | DS2 DS3 DS4 DS5 DS6 |
| 389 0004 103 | LED, YEL, 2.4MM ROUND ESD | 1 EA | DS1 |
| 389 0010 001 | LED, RED 0805 DIFFUSED ESD | 1 EA | DS7 |
| 393 0086 000 | *CPLD, XC9536XL (QFP-44) | 1 EA | U16 |
| 404 0869 000 | SOCKET, PLCC-32, SMT | 2 EA | XU9 XU10 |
| 496 0095 000 | INDUCTOR 33UH +/-20% SMT | 2 EA | L3 L4 |
| 496 0114 000 | IND, POWER 250UH 20% | 1 EA | T1 |
| 515 0134 205 | *CAP 150PF 0805 C0G 100V 5% | 2 EA | C98 C105 |
| 515 0134 209 | *CAP 220PF 0805 C0G 100V 5% | 2 EA | C59 C60 |
| 515 0134 213 | *CAP 330PF 0805 C0G 100V 5% | 2 EA | C80 C84 |
| 515 0134 217 | *CAP 470PF 0805 C0G 100V 5% | 4 EA | C36 C40 C41 C73 |
| 515 0135 301 | *CAP 1000PF 1206 C0G 100V 5% | 2 EA | C77 C88 |
| 515 0136 401 | *CAP 0.01UF 0805 X7R 100V 10% | 1 EA | C127 |
| 515 0136 501 | *CAP 0.1UF 0805 X7R 50V 10% | 82 EA | C1 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C14 C18 C19 C20 C23 C24 C25 C26 C31 C32 C33 C34 C35 C37 C38 C39 C42 C43 C44 C45 C46 C47 C52 C55 C56 C63 C64 C66 C67 C68 C69 C70 C74 C75 C76 C78 C81 C82 C83 C85 C86 C87 C89 C90 C91 C92 C93 C94 C95 C96 C97 C100 C101 C102 C103 C106 C107 C109 C110 C111 C113 C115 C116 C117 C118 C119 C120 C123 C126 C128 C129 |
| 515 0137 601 | CAP 1UF 1206 X7R 25V 10% | 1 EA | C49 |
| 515 0139 601 | *CAP 1UF 1812 Z5U 50V 20% | 2 EA | C65 C71 |
| 523 0001 201 | CAP 100UF 6.3V 20% SMT | 18 EA | C13 C15 C16 C17 C21 C22 C27 C28 C29 C30 C50 C53 C54 C57 C58 C62 C79 C108 |
| 523 0002 201 | CAP 100UF 25V 20% 8MM 105C | 6 EA | C72 C114 C121 C122 C124 C125 |
| 523 0003 101 | CAP 10UF 35V 20% SMT | 7 EA | C2 C48 C51 C61 C99 C104 C112 |
| 540 1568 000 | RES NTWK 10K OHM 5% BUSS | 2 EA | R16 R30 |
| 545 0308 109 | RES 22.1 OHM 1% 1/8W 0805 | 35 EA | R31 R32 R33 R34 R35 R36 R37 R39 R40 R41 R42 R44 R45 R47 R48 R49 R51 R52 R53 R54 R55 R56 R57 R58 R59 R60 R61 R62 R93 R94 R95 R96 R97 R98 R99 |
| 545 0308 115 | RES 39.2 OHM 1% 1/8W 0805 | 12 EA | R128 R129 R130 R131 R132 R133 R134 R135 R136 R137 R138 R139 |
| 545 0308 120 | RES 61.9 OHM 1% 1/8W 0805 | 4 EA | R82 R84 R88 R89 |
| 545 0308 201 | RES 100 OHM 1% 1/8W 0805 | 3 EA | R1 R2 R3 |
| 545 0308 205 | RES 150 OHM 1% 1/8W 0805 | 1 EA | R63 |
| 545 0308 207 | RES 182 OHM 1% 1/8W 0805 | 1 EA | R20 |
| 545 0308 209 | RES 221 OHM 1% 1/8W 0805 | 3 EA | R67 R114 R115 |
| 545 0308 212 | RES 301 OHM 1% 1/8W 0805 | 2 EA | R26 R28 |
| 545 0308 214 | RES 357 OHM 1% 1/8W 0805 | 3 EA | R18 R21 R23 |
| 545 0308 217 | RES 475 OHM 1% 1/8W 0805 | 9 EA | R7 R8 R9 R10 R11 R12 R13 R14 R15 |
| 545 0308 221 | RES 681 OHM 1% 1/8W 0805 | 1 EA | R118 |
| 545 0308 223 | RES 825 OHM 1% 1/8W 0805 | 2 EA | R24 R29 |



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| | | | |
|---|---|---|---|
| 545 0308 301 | RES 1K OHM 1% 1/8W 0805 | 11 EA | R4 R5 R38 R46 R77 R91 R92 R100 R103 R106 R108 |
| 545 0308 304 | RES 1.3K OHM 1% 1/8W 0805 | 1 EA | R73 |
| 545 0308 305 | RES 1.5K OHM 1% 1/8W 0805 | 1 EA | R109 |
| 545 0308 308 | RES 2K OHM 1% 1/8W 0805 | 3 EA | R71 R87 R112 |
| 545 0308 311 | RES 2.67K OHM 1% 1/8W 0805 | 1 EA | R107 |
| 545 0308 312 | RES 3.01K OHM 1% 1/8W 0805 | 1 EA | R83 |
| 545 0308 313 | RES 3.32K OHM 1% 1/8W 0805 | 1 EA | R116 |
| 545 0308 322 | RES 7.5K OHM 1% 1/8W 0805 | 2 EA | R79 R81 |
| 545 0308 401 | RES 10K OHM 1% 1/8W 0805 | 21 EA | R6 R19 R22 R25 R27 R43 R65 R66 R70 R101 R102 R110 R111 R117 R120 R122 R123 R124 R125 R126 R127 |
| 545 0308 411 | RES 26.7K OHM 1% 1/8W 0805 | 2 EA | R80 R90 |
| 545 0308 416 | RES 43.2K OHM 1% 1/8W 0805 | 1 EA | R69 |
| 545 0308 501 | RES 100K OHM 1% 1/8W 0805 | 2 EA | R17 R50 |
| 545 0308 601 | RES 1M OHM 1% 1/8W 0805 | 2 EA | R72 R74 |
| 545 0308 611 | RES 2.67M OHM 1% 1/8W 0805 | 1 EA | R86 |
| 551 0017 302 | TRIMPOT 2K OHM 1/4W 4MM SQ | 1 EA | R104 |
| 551 0017 305 | TRIMPOT 5K OHM 1/4W 4MM SQ | 4 EA | R64 R78 R113 R121 |
| 551 0017 401 | TRIMPOT 10K OHM 1/4W 4MM SQ | 2 EA | R105 R119 |
| 551 0017 402 | TRIMPOT 20K OHM 1/4W 4MM SQ | 1 EA | R68 |
| 551 0017 602 | TRIMPOT 2MEG OHM 1/4W 4MM SQ | 1 EA | R76 |
| 561 0003 011 | POSISTOR 1.1 AMP 30VDC 2029 | 2 EA | R75 R85 |
| 603 0004 000 | DIPSWITCH, 8-SPST SMT-16 | 2 EA | S1 S3 |
| 604 1163 000 | SW, PB MOM SPST-NO TACT (SMT) | 1 EA | S4 |
| 604 1201 000 | SW, TOGGLE DPDT VERTICAL (SMT) | 1 EA | S2 |
| 610 1330 000 | TEST POINT, RECT-LOOP, SMT | 23 EA | TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 |
| 646 2110 000 | BARCODE, SN_ITEM_REV | 1 EA | |
| 843 5400 771 | SCH, ACC+ | 0 DWG | |
| 843 5400 773 | PWB, ACC+ | 1 EA | |

**Table 7-27 ASSY, ACC+ - 992 9764 525 (B)**

| Harris PN | Description | Qty UM | Ref Des |
|---|---|---|---|
| 250 0119 000 | CABLE, 15C 22AWG STRD | 2 FT | |
| 250 0274 000 | CORD, AC, 3C, NEMA/IEC PLUG | 1 EA | |
| 250 0517 000 | POWER SUPPLY CORD | 1 FT | |
| 2520002000A | *WIRE, MIL, 22AWG 1000V GREEN | 10 FT | |
| 253 0059 000 | CABLE, 2C 22AWG AUDIO | 10 FT | |
| 302 0350 000 | SCREW, FHMS 4-40 X 5/16 SST | 8 EA | |
| 302 0380 000 | SCR, 6-32 X 5/16 | 10 EA | |
| 354 0385 000 | CONTACT, SOCKET (24-20AWG) | 15 EA | |
| 354 0615 000 | TERM. FOR 22-26 AWG CRIMP | 2 EA | |
| 354 0669 000 | LUG QC FEM 250 22-18AWG RED | 3 EA | |
| 354 0749 000 | LUG QC FEM 250 22-18AWG RED FLAG | 1 EA | |
| 358 1214 000 | SCREWLOCK, M/F 4-40X3/16" | 2 EA | |
| 358 3728 000 | ACCESSORIES, SLIDE RACK MTG | 1 PR | |
| 384 0695 000 | LED GREEN CART 12V ESD | 1 EA | |
| 384 0842 000 | LED AMBER CART 12V | 1 EA | |
| 406 0491 000 | PLUG WIRING FOR LED CART | 2 EA | |
| 458 0003 000 | *SLIDES, DRAWER PAIR, 12" | 1 PR | |
| 484 0446 000 | *FILTER, RFI POWER LINE ENTRY | 1 EA | |
| 540 1600 108 | RES 20 OHM 3W 5% | 1 EA | |



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| | | | |
|---|---|---|---|
| 604 1272 000 | SW, TOGGLE SPDT | 1 EA | |
| 610 0200 000 | RECEPTACLE 3 CONTACT | 3 EA | |
| 610 1374 000 | PLUG/RECP, D, 15C FILTERED | 1 EA | |
| 612 0200 000 | *RECP, XLR, 3C CIRCULAR | 1 EA | |
| 612 0536 000 | RECP 09-50-3031 | 1 EA | |
| 612 0543 000 | RECP, DSUB 15PIN CRIMP-POKE | 1 EA | |
| 618 0051 000 | COAX, RG58C, 50 OHM | 2 FT | |
| 620 0455 000 | ADAPTER, BNC JACK-JACK | 1 EA | |
| 620 1951 000 | STRAIGHT PLUG BNC CRIMP | 2 EA | |
| 620 2543 000 | RECP, BNC, PC MT, RT ANGLE | 1 EA | J002 |
| 736 0292 000 | PSU, SWITCHING, TRIPLE OUTPUT | 1 EA | |
| 843 5215 578 | WIRING DIAG, ACC+ | 0 DWG | |
| 943 5215 575 | CHASSIS, ACC+ | 1 EA | |
| 943 5215 576 | FRONT PANEL | 1 EA | |
| 943 5215 577 | TOP COVER, ACC+ | 1 EA | |
| 943 5215 589 | COVER, POWER SUPPLY | 1 EA | |
| 992 9764 319 | ACC+ BOARD | 1 EA | |