



Model 412

Frequency Agile Program SCPC



WARRANTY and ASSISTANCE

COASTCOM's products are warranted against defects in materials and workmanship for a period of eighteen months from the date of factory shipment or one year from the date of installation, whichever occurs first. COASTCOM will, at its option, repair or replace products which prove to be defective during the warranty period provided they are returned to COASTCOM, and provided the proper operating procedures as listed in this manual are followed. Repairs necessitated by misuse of the product are not covered by this warranty. No other warranties are expressed or implied.

COASTCOM certifies that this equipment met its published specifications at the time of shipment from the factory. Your equipment should be inspected and tested immediately upon receipt. If the equipment is damaged in any way, or fails to operate properly, file a claim with the carrier and notify us.

For assistance, factory service, or the return of equipment please contact:

COASTCOM
2312 Stanwell Drive
Concord, CA 94520
Phone: 415-825-7500
TWX: 910-481-5781



The mechanical and electrical design of this equipment is subject to change without notice as deemed necessary by COASTCOM.

OPERATION AND MAINTENANCE MANUAL MODEL 412 DEMOD

CONTENTS		Page
Section 1.	GENERAL INFORMATION ON 412 DEMOD	1
1.01	Purpose/Function	
1.02	Description	
1.03	Characteristics and Performance Specifications	
1.04	Equipment Listing	
Section 2	THEORY OF 412 DEMOD	3
2.01	Block Diagram	
2.02	412 DEMOD Functional Description	
2.03	412 DEMOD Power Supply Functional Description	
Section 3	PREPARATION FOR USE OR RESHIPMENT	6
3.01	Unpacking and Inspection	
3.02	Installation	
3.03	External Connections	
3.04	Initial Test and Alignment	
3.05	Storage and Reshipment	
Section 4	OPERATION OF 412 DEMOD	10
4.01	Controls and Indicators	
4.02	Turn-on Procedure	
4.03	Operating Procedure	
4.04	Turn-off Procedure	
4.05	Emergency Operation	
Section 5	DIAGRAMS OF 412 DEMOD	12
Section 6	MAINTENANCE OF 412 DEMOD	22
6.01	General	
6.02	Test and Alignment	
6.03	Troubleshooting	
6.04	Repair	
6.05	Replacement Parts List	

SECTION 1 GENERAL INFORMATION

Para. Contents

- 1.01 Purpose/Function
- 1.02 Description
- 1.03 Characteristics & Performance Specifications
- 1.04 Equipment Listing

1.01 Purpose/Function

COASTCOM's Model 412 DEMOD is a frequency agile SCPC (single-channel-per-carrier) receive terminal which demodulates a 15 kHz baseband audio program signal directly from the 52 to 88 MHz spec-

trum. See Figure 1. The 412 DEMOD's frequency agility feature provides front panel or remote control selection of up to 12 different channels.

The 412 DEMOD is designed for use in the satellite reception of high quality audio program material. The SCPC technique provides the user with direct satellite access from any location without having to combine with other channels.

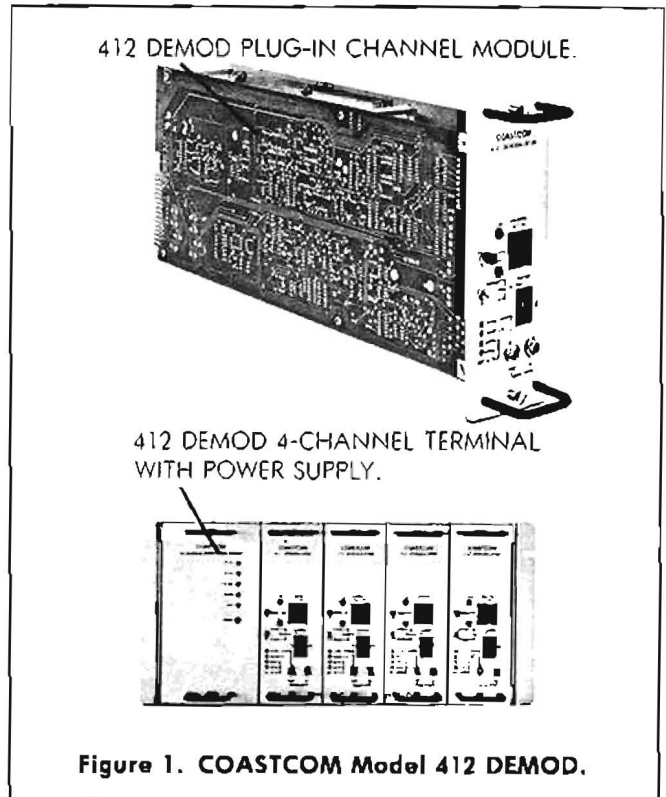


Figure 1. COASTCOM Model 412 DEMOD.

The 412 DEMOD incorporates COASTCOM's patented phase-locked-loop detector to provide threshold extension. This feature allows the 412 DEMOD to perform well in adverse noise environments created by such parameters as low earth station antenna look-angle, weak satellite footprint signal, etc. Figure 2 depicts a typical application of the 412 DEMOD.

1.02 Description

The 412 DEMOD is designed as a plug-in module to a standard-sized and powered 412 shelf. The standard shelf measures 222.5mm (8.75 inches) high, by 483mm (19 inches) wide, by 457.2mm (18 inches) deep, and occupies five vertical spaces in a standard 483mm (19 inch) equipment rack. The shelf contains slots for a single 412 DEMOD power supply and up to four 412 DEMOD's. When fully loaded with four

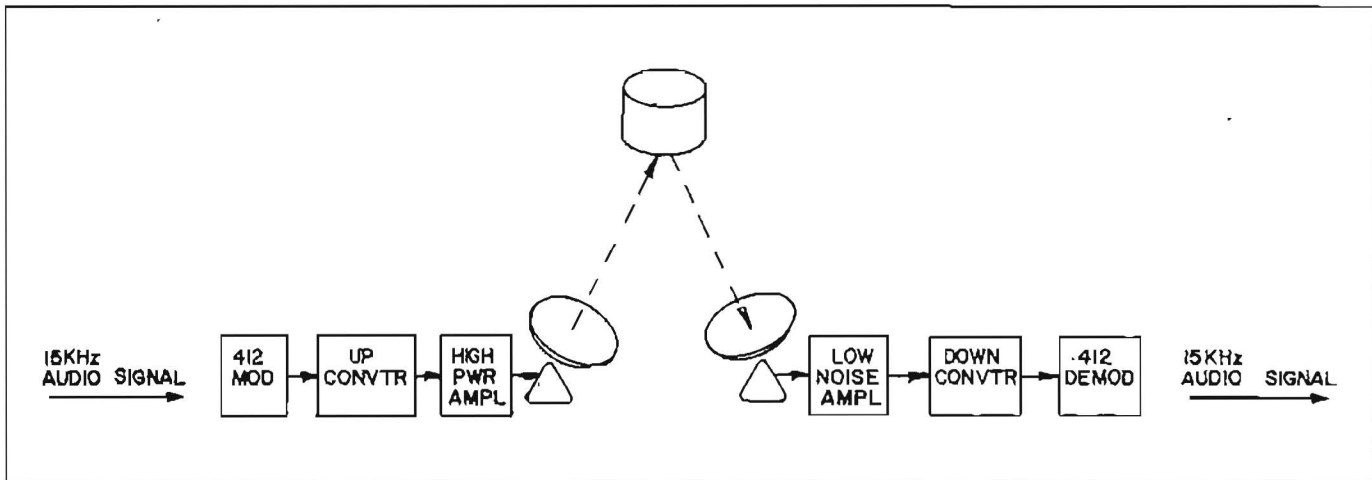


Figure 2. Typical Application of Model 412 DEMOD.

DEMOD's and power supply the 412 DEMOD shelf weighs approximately 20.8kg (46 pounds).

Operating power for the 412 DEMOD is 108 - 132 VAC, 57/63 Hz only. The power connection is made to the backplane from the rear of the terminal.

Figure 3 identifies the location of all modules and assemblies.

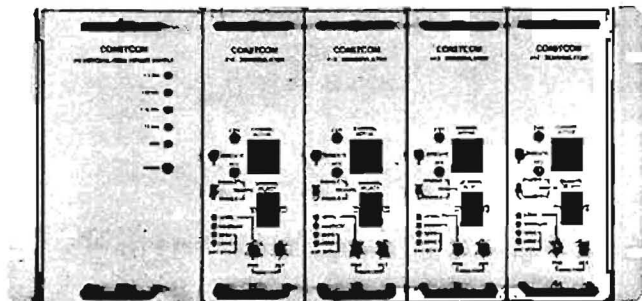


Figure 3. Model 412 DEMOD Shelf Configuration.

Each 412 DEMOD can operate on any one of twelve frequencies. Manually switching channels involves selecting the desired channel number on a front panel thumbwheel switch, and then pressing the EXECUTE button when switching is desired. Remote control switching is also offered when appropriate hookups are made through the remote control connector provided on the backplane. Channel switching time is typically less than 100 milliseconds.

1.03 Characteristics

Physical, environmental and electrical characteristics are listed in Table 1.

1.04 Equipment Listing

Major subassemblies and plug-in's are listed in Table 2.

TABLE 1
412 DEMOD CHARACTERISTICS

ITEM	CHARACTERISTICS	
1. Shelf Size	222.5 mm (8.75 in) high (5 RMS) 482.6 mm (19.00 in) wide 457.2 mm (18.00 in) deep	
2. Shelf Weight w/power supply + 4 DEMOD's	Approx. 20.8 kg (46 lbs)	
3. Service Conditions	<i>Operating</i>	<i>Storage</i>
• Ambient Temperature (C)	0° - +51°	-65° - +70°
• Relative Humidity (%)	95	95
• Altitude (feet ASL)	10,000	40,000
• Vibration and Shock	None	Normal Handling
• Duty	Continuous, Unattended	
4. Power Requirements	108 - 132 VAC at 57/63 Hz	
5. Input Requirements		
• Frequency	52 to 88 MHz	
• Level	-65 to -20 dBm	
• Impedance	75 ohms, (unbalanced)	
• Return Loss	≥23 dB	
6. Output		
• Frequency	50 Hz to 15 kHz	
• Level	+18 dBm PPL, +4 dBm APL	
• Impedance	600 ohms balanced	
• Return Loss	≥23 dB	

Table Continued on Next Page →

7. Performance Specifications (412 DEMOD only)	
• Signal-to-noise ratio	$S/N = C/N' + 27.0\text{dB}$ $\pm 0.5\text{dB}$
• Noise Figure	$\leq 15\text{ dB}$
• AM Rejection	$\geq 40\text{ dB}$
• Adjacent Channel Rejection	$\geq 65\text{ dB}$
• AFC Range	$\pm 80\text{kHz}$
• Signal to Periodic Noise	$\geq 67\text{ dB}$
8. Performance Specifications (412 DEMOD and MOD back to back)	
• Level Tracking	$\leq \pm 2.5\text{ dB}$
• Frequency Response	50 Hz to 125 Hz $+0.4\text{ to }-0.8\text{ dB}$ 125 Hz to 10kHz $\pm 0.4\text{ dB}$ 10kHz to 15kHz $+0.4\text{ to }-0.8\text{ dB}$
• Crosstalk	$\leq -85\text{ dB}$
• Interchannel Phase Difference	$\leq 13\text{ degrees}$
• Total Harmonic Distortion	$\leq 1\%$
• Intermodulation Distortion	$\leq 1\%$
• Group Delay Distortion	@ 50 Hz $\leq 8\text{ msec}$ @ 15kHz $\leq 3\text{ msec}$
• RMS Noise	$\geq 65\text{ dB below PPL}$

* C/N measured in 200 kHz BW

TABLE 2
412 EQUIPMENT LISTING
(See Notes Below)

SUBASSEMBLY DESCRIPTION	COASTCOM PART NUMBER	ROCKWELL/COLLINS PART NUMBER
412 Wired Shelf Assembly-MOD	113013-00	640-4370-006
412 Wired Shelf Assembly-DEMOM	113012-00	640-4440-004
412 MOD Power Supply	112885-00	640-4370-005
412 DEMOM Power Supply	113015-00	640-4440-005
412 DEMOM Plug-in	113011-00	640-4440-003
412 MOD Plug-in	112014-00	640-4370-004

NOTE 1: DEMOM Shelf Assembly (COASTCOM No. 113012-00) will accommodate 412 MOD plug-in modules with easy field modification - no extra parts or special tools required. MOD Shelf Assembly (COASTCOM No. 113013-00) will only accommodate 412 MOD plug-ins.

NOTE 2: MOD Power Supply (COASTCOM No. 112885-00) can be used for either 412 MOD's or DEMOM's (and any combination in a four slot 412 shelf) DEMOM Power Supply (COASTCOM No. 113015-00) can only be used for 412 DEMOMS.

NOTE 3: Both Power Supplies and both MOD and DEMOM plug-ins will fit in either shelf.

NOTE 4: The only difference between MOD and DEMOM shelves is that the DEMOM contains a backplane mounted RF input signal divider which is backplane connected to DEMOM plug-in positions.

SECTION 2 THEORY OF 412 DEMOD

Para. Contents

2.01 Block Diagrams

2.02 412 DEMOD Functional Description

2.03 412 DEMOD Power Supply Functional Description

2.01 Block Diagrams

Figure 4 is a block diagram depicting the functional operation of the 412 DEMOD. Figure 5 depicts the 412 DEMOD power supply operation.

2.02 412 DEMOD Functional Description

The 412 DEMOD accepts an RF composite signal in the range of 52 to 88 MHz, selects the appropriate carrier, demodulates the carrier, and expands the resultant signal to produce a 50 Hz to 15 kHz audio signal. Each 412 DEMOD module can rapidly select, either manually or by remote control, any one of 12 channels corresponding to 12 carrier frequencies spaced $\geq 300\text{ kHz}$ apart in the same satellite transponder. The actual 412 DEMOD is a plug-in assembly to a powered 412 shelf. The 412 shelf can hold up to four 412 DEMOD's. The 412 DEMOD can be used for the reception of stereo (2- 412 DEMOD's) or monaural (1- 412 DEMOD) audio program material.

Input to the 412 DEMOD is an RF signal in the frequency range 52 to 88 MHz. This RF signal first comes to the 412 DEMOD shelf power splitter located on the backplane. The required signal input level is -80 to -20 dBm . The splitter splits the signal equally among four output ports which are intended for connection to the four individual DEMOD's with BNC connections.

This RF signal is first presented to a wideband amplifier which is used to impedance match the baseband to the receiver circuitry over the entire range. The downconverter can operate down to -80 dBm with a return loss of better than 23 dB at all frequencies. A 3 MHz bandpass filter prevents strong adjacent channels from overloading the first stage and reduces total interference before the signal is amplified. This filter is electronically tunable over the entire IF band. A wide dynamic range dual-insulated gate FET provides immunity from intermodulation products and also provides AGC. Next, two critically coupled tuned circuits constitute a bandpass filter to provide good image rejection. This filter is also electronically tuned by feedback from the synthesizer.

A double-balanced mixer converts the transponder frequency down to 10.7 MHz. The mixer has a wide dynamic range with extremely low noise. This

REVISIONS			
ISSUE	DESCRIPTION	DATE	APPROVED
8	ECO# 400-173,	8-1-77	TCW

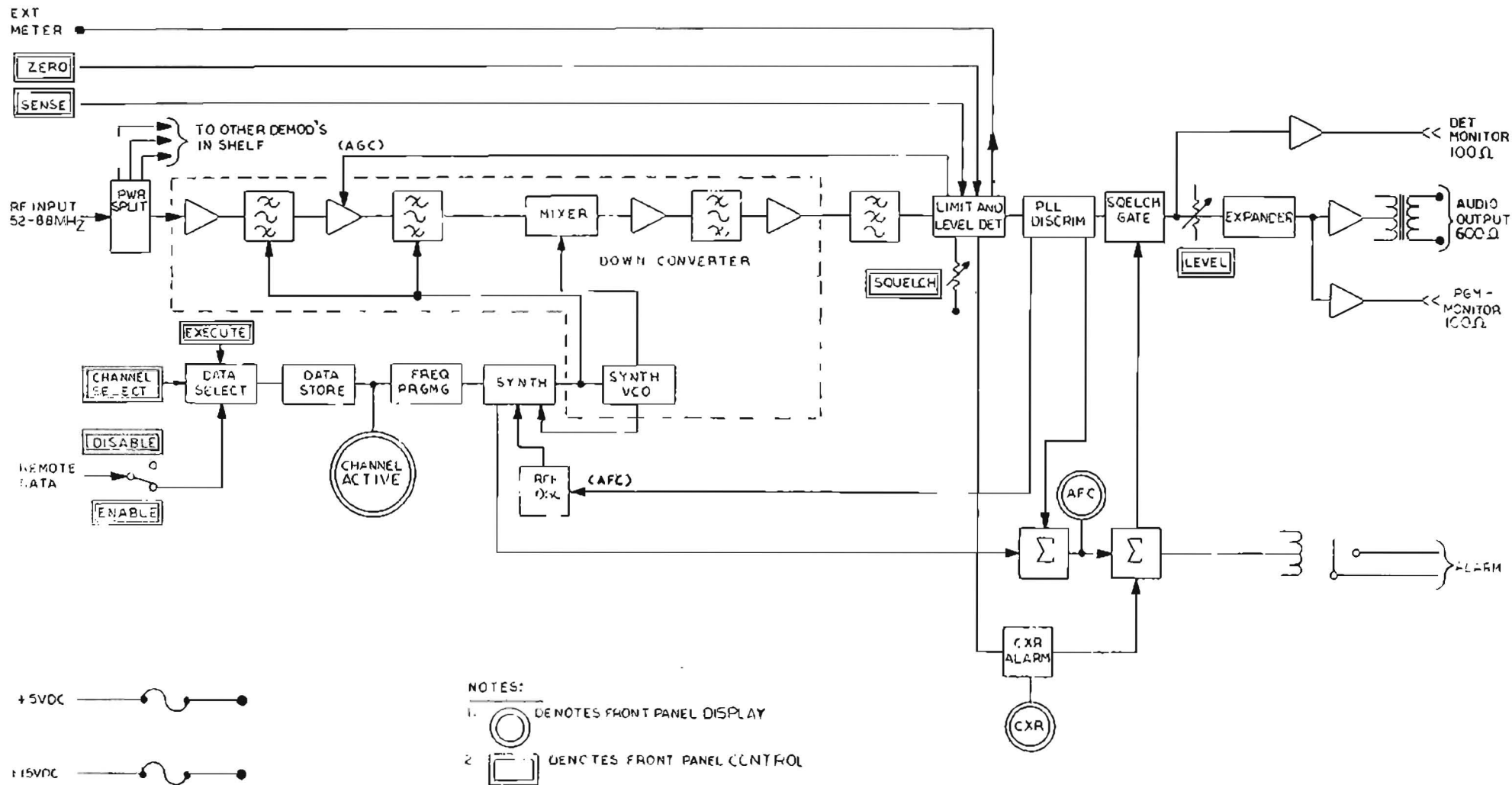
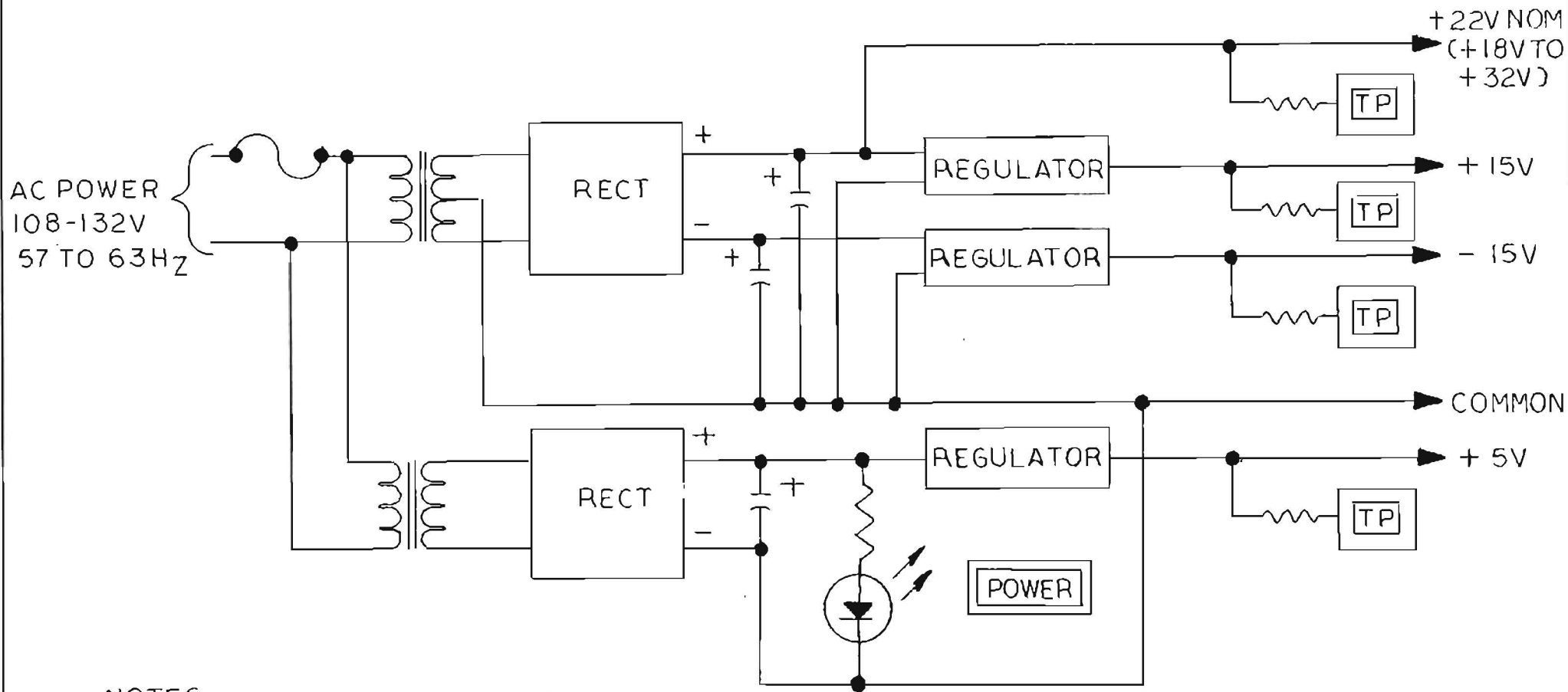


Figure 4. Model 412 DEMOD Functional Block Diagram.

TITLE 412 DEMOD BLOCK DIAGRAM	COASTCOM
DATE DRAWN 7/12/77 APPROVED JLM	ASBY C113 093-00 B



NOTES

I.  DENOTES FRONT PANEL LOCATION.

TITLE 412 DEMODULATOR POWER SUPPLY BLOCK DIAGRAM		COASTCOM	
DATE DRAWN		ASSY.	
APPROVED <i>VLM</i>		A113 092-00 A	

Figure 5. Model 412 DEMOD Power Supply Block Diagram.

device substantially reduces spurious emissions normally experienced in conventional mixers.

The mixing frequency emanates from the synthesizer VCO. This oscillator will operate at 10.7 MHz above the desired receive channel frequency. This frequency is determined from front panel (CHANNEL SELECT) or remote channel selection inputs. One of twelve channels, each corresponding to a unique frequency, can be selected and executed (EXECUTE). A PROM converts the desired channel number to its corresponding frequency. This frequency is given to the synthesizer which proceeds to operate and stabilize to a new synthesizer VCO frequency. Use of a Prom, which is easily replaced manually, facilitates implementation of a different frequency plan.

The converted 10.7 MHz signal is coupled into a low noise amplifier to make up mixer and filter losses. Another bandpass filter restricts the channel to 230 kHz. This allows channel positioning at every 300 kHz in the RF spectrum. A terminating amplifier matches the filter output accurately and delivers the signal to the FM receiver module.

The FM receiver's low pass filter insures that all high frequency products from the oscillator and mixer are attenuated. This is important when the input level to the down converter is low. Prior to demodulation, a limiter holds constant the level to the PLL (phase-locked-loop) discriminator. This insures that the gain of the detector is constant.

Demodulation is performed by a PLL which incorporates a low noise, high linear VCO. The PLL acts as a tracking filter which extends the threshold of clicking. The demodulator audio level is unaffected by ambient temperatures within its operating range, unlike most other detector types.

Squelch circuits and alarm circuits follow to aid in monitoring and control functions. The squelch circuit is continuously adjustable from -35 to -76 dBm of input signal. Alarm information is combined so that either AFC (frequency stability) or CXR (signal level) will cause the audio output to be squelched.

The signal is next presented to the expander which improves the signal-to-noise ratio by approx. 30 dB, and expands its dynamic range by a ratio of 1:3. The power amplifier following the expander is a high quality, low noise circuit delivering a maximum audio level of +22 dBm. Audio output impedance is 600 ohms balanced.

2.03 Power Supply Functional Description

The power supply accepts 108 to 132 VAC power 57 to 63 Hz, rectifies it and regulates it to produce four separate line voltages:

- +5 Vdc
- +15 Vdc
- 15 Vdc
- +22 Vdc nominal ($+18 < V < +32$)

All voltages as measured from the front panel should be as indicated within +0.5 V except for +22 V which varies depending upon the number of 412 DEMOD's plugged in to the shelf. A front panel LED indicates power supply operation.

The 412 DEMOD power supply can only be used for 412 DEMOD plug-ins.

SECTION 3 PREPARATION FOR USE OR RESHIPMENT

Para.	Contents
3.01	Unpacking and Inspection
3.02	Installation
3.03	External Connections
3.04	Initial Test and Alignment
3.05	Storage and Reshipment

3.01 Unpacking and Inspection

The 412 DEMOD is shipped in a heavy cardboard box with sufficient packing materials to cushion the equipment from normal freight handling procedures. The equipment should be unpacked and inspected in an area that is dry, dust free, and as close to the final installation as practical. With a sharp-edged object, cut the packing tape which seals the box closed. Remove the packing material and carefully lift out the 412 DEMOD shelf.

The following steps should be followed in inspection:

- a. Check packing material and carton thoroughly for documents and for any parts that may have become detached during shipment.
- b. Check equipment against packing list.
- c. Check equipment for physical damage. If there are damaged or missing items, record all information in detail and, if possible, obtain photographic evidence. Retain all inspection and packaging documentation for reference. Notify transportation carrier and COASTCOM of any equipment damage or discrepancy in shipping documents versus equipment received.

If the unit must be returned, rewrap in an anti-static bag. Place all pertinent documents in a waterproof bag and attach this bag to wrapped assembly. Reseal the box if it is not damaged. Mark box FRAGILE, ELECTRONIC EQUIPMENT, and indicate top of box with red arrows.

3.02 Installation

The 412 DEMOD is shipped in a self-contained shelf. Determine where in the installation site's equipment rack the 412 DEMOD is to be installed. Place the unpacked 412 DEMOD in the desired position and fasten the unit to the rack channelling with four screws, two on each side.

The 412 DEMOD plug-in modules were shipped in place and tightened down to the shelf with the thumbscrews on each plug-in front panel. Make sure that these thumbscrews have not become loosened and that each module is properly plugged into its shelf backplane connector.

Now follow the instructions of Paragraph 3.03 to make necessary external connections to the 412 DEMOD for operation.

3.03 External Connections

For operation, every 412 DEMOD system must receive power. Additionally, there are required signal connections to the separate DEMOD modules. Connections for remote control and status information are optional. All connections are made at the backplane of the 412 DEMOD shelf. See Figure 6 for a pictorial presentation of connections to the 412 DEMOD.

a. Power Connection

The 412 DEMOD shelf comes equipped with a power cord and three-prong plug for 108 - 132 VAC operation (power consumption of fully loaded shelf is less than 50 watts). This cord

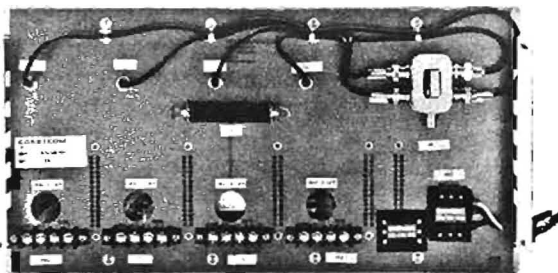


Figure 6. External Backplane Connections to Model 412 DEMOD.

CONNECTION J6 IS RF SIGNAL INPUT.
SEE BACKPLANE SCHEMATIC DRAWING NO C113015-00A
IN SECTION 5.
FOR CONNECTIONS T81-T85 AND J5.

comes connected to the power terminal block on the backplane. To obtain power, simply plug into the standard U.S. three-prong power receptacle. When power is applied, the power supply's front panel POWER LED should go on.

WARNING

The full AC power load is carried by the bottom 4 pins of the furthest right 30 pin backplane connector (as unit is viewed from the rear). THESE PINS PROTRUDE THROUGH THE BACKPLANE. These pins have been covered at the factory and carry a WARNING label. However, use extreme caution if working on the backplane in the vicinity of these pins. See Figure Number 6 for detail.

b. RF Connection to 412 DEMOD

The required signal input to the 412 DEMOD is the RF (52 to 88 MHz) signal coming from the down converter. The RF signal must first be connected to the backplane signal divider from the bottom as shown. This is a BNC connection. The RF connection from the signal divider to the DEMOD is done in the factory.

c. Audio Output from 412 DEMOD

Each 412 DEMOD produces an audio signal. This signal is received through the three-pin terminal block provided on the backplane for each 412 DEMOD.

+ (tip)
- (ring)
GND (sleeve)

This should be a shielded twisted-pair connection. NOTE: The audio is phased so that a positive voltage at the + audio output terminal is produced by an upward frequency deviation.

d. Remote Control and Status Information

Each 412 DEMOD shelf backplane has a self-contained female 50-pin connector through which (optional) control and status information can pass to/from the 412 DEMOD. Table 3 shows the pin assignments which are incorporated in the 412 DEMOD.

Input data, output data and execute are positive 15 volt CMOS levels. Input data and output data are binary and indicate the channel number.

TABLE 3
412 DEMOD REMOTE CONTROL CONNECTOR
PIN ASSIGNMENTS

PIN		FUNCTION
1	DEM0D 1	ALARM RELAY
2	DEM0D 1	ALARM RELAY
3	DEM0D 1	OUTPUT 2 ^o BIT-MSB
4	DEM0D 1	OUTPUT 2 ^o BIT
5	DEM0D 1	OUTPUT 2 ^o BIT
6	DEM0D 1	OUTPUT 2 ^o BIT-LSB
7	DEM0D 1	INPUT 2 ^o BIT-LSB
8	DEM0D 1	INPUT 2 ^o BIT
9	DEM0D 1	INPUT 2 ^o BIT
10	DEM0D 1	INPUT 2 ^o BIT-MSB
11	DEM0D 1	REMOTE EXECUTE
12		GROUND
13		GROUND
14	DEM0D 4	ALARM RELAY
15	DEM0D 4	ALARM RELAY
16	DEM0D 4	OUTPUT 2 ^o BIT-MSB
17	DEM0D 4	OUTPUT 2 ^o BIT
18	DEM0D 4	OUTPUT 2 ^o BIT
19	DEM0D 4	OUTPUT 2 ^o BIT-LSB
20	DEM0D 4	INPUT 2 ^o BIT-LSB
21	DEM0D 4	INPUT 2 ^o BIT
22	DEM0D 4	INPUT 2 ^o BIT
23	DEM0D 4	INPUT 2 ^o BIT
24	DEM0D 4	REMOTE EXECUTE
25		GROUND
26		GROUND
27	DEM0D 2	REMOTE EXECUTE
28	DEM0D 2	INPUT 2 ^o BIT-MSB
29	DEM0D 2	INPUT 2 ^o BIT
30	DEM0D 2	INPUT 2 ^o BIT
31	DEM0D 2	INPUT 2 ^o BIT-LSB
32	DEM0D 2	OUTPUT 2 ^o BIT-LSB
33	DEM0D 2	OUTPUT 2 ^o BIT
34	DEM0D 2	OUTPUT 2 ^o BIT
35	DEM0D 2	OUTPUT 2 ^o BIT-MSB
36	DEM0D 2	ALARM RELAY
37	DEM0D 2	ALARM RELAY
38		+15 VDC
39		GROUND
40	DEM0D 3	REMOTE EXECUTE
41	DEM0D 3	INPUT 2 ^o BIT-MSB
42	DEM0D 3	INPUT 2 ^o BIT
43	DEM0D 3	INPUT 2 ^o BIT
44	DEM0D 3	INPUT 2 ^o BIT-LSB
45	DEM0D 3	OUTPUT 2 ^o BIT-LSB
46	DEM0D 3	OUTPUT 2 ^o BIT
47	DEM0D 3	OUTPUT 2 ^o BIT
48	DEM0D 3	OUTPUT 2 ^o BIT-MSB
49	DEM0D 3	ALARM RELAY
50	DEM0D 3	ALARM RELAY

Output data is static and should be loaded only according to CMOS restrictions. Input data can be static. Input data is entered only when the ENABLE/DISABLE switch is in the "ENABLE" position and a positive "execute" pulse is supplied to the remote execute input. For proper operation, the input data must be present at the same time or before the "execute" pulse and at least 50 microseconds after the "execute" pulse is removed. A continuous execute pulse is not acceptable. The length of the execute pulse is not critical. It is estimated

that 1 to 100 milliseconds is adequate. Simple momentary pushbutton activation would be sufficient.

A + 15 volt output on the remote programming connector is to be used in the remote logic so that the logic levels will always be compatible and so that on "power up" the remote unit always gives a valid input channel number. The remote logic should be CMOS so that the power drain is low and the receiver power supply does not have to be over-designed only for the remote unit. The remote read-out only should have its own supply. An additional current drain of 200 mA can be drawn from the existing + 15 volt supply in the modulators or demodulators.

The "Data Out" comes directly off the MC14042 latch, so that if these lines are loaded to prevent logic "0" below +1.5 volts, or logic "1" above +3.75 volts, the demodulator programming would be impaired. If the remote is connected and these data lines are connected to an unpowered gate, the clamp diodes may cause excessive loading. Protective resistors of approximately 22K ohms could be used at the remote end in series with the CMOS inputs if the remote + 15 volt supply is not provided from the unit it drives.

The outputs of the remote unit should present a relatively low impedance, such as that obtained from a CMOS gate output, to preserve noise immunity with a long remote cable.

3.04 Initial Test and Alignment

There are a few simple tests and indicators to observe in determining basic function of the 412 DEMOD. If results are positive from these, then proceed to test the 412 DEMOD in its system configuration. If system level tests are normal, the 412 DEMOD should be considered functionally operational. If there are problems with system test results, see Section 6 - Maintenance, or contact COASTCOM directly. No field alignment from other than the front panel is recommended.

Table 4 indicates recommended test equipment for installation of the 412 DEMOD.

TABLE 4
RECOMMENDED TEST EQUIPMENT
FOR 412 DEMOD INSTALLATION

DESCRIPTION	TYPE
Digital Multimeter	H.P. 3476A
AC Voltmeter	Fluke 8920A

The following tests or observations should be made at installation once the connections described in Section 3.03 have been made. Refer to Section 6 - Maintenance, if problems arise.

CAUTION

Operational Testing should not require alignment to the unit as all alignment has been done in the factory. If specified test results are not obtained at first be sure to check your test set-up and test procedures before proceeding with any alignment.

- Power**
- a. Check to see that "POWER" LED is glowing on front panel.
 - b. An extinguished LED could mean:
 - no power is being supplied to shelf
 - LED is blown
 - power supply fuse is blown
 - power supply is malfunctioning
 A blown fuse can be replaced by unplugging power supply. Fuse is located near rear of PCB card. Repeated fuse failure indicates power supply malfunction, or a shorted output.
 - c. With a Digital Multimeter check the four voltage level test points on the front panel. Voltages should be as indicated -0 Vdc + 0.5 Vdc except for +22 Volts which will vary from +18 Vdc to +32 Vdc depending upon the number of 412 DEMOD's plugged in and the AC input voltage.

Channel

- Selection**
- a. Dial thumbwheel switch to desired channel (1 through 12).
 - b. Push EXECUTE button.
 - c. Selected channel should immediately appear on CHANNEL ACTIVE display.
 - d. If RF carrier is being fed to terminal then CXR and AFC LED's should be glowing.
 - e. Repeat steps a through d for both REMOTE-ENABLE and DISABLE.
 - f. If remote control hookup is made through back panel, switch to REMOTE-ENABLE. Have remote site select and execute channels automatically and check steps c and d.

Carrier Presence and Level

- a. The CXR LED should be glowing if an RF signal is being applied to the 412 DEMOD backplane.
- b. An extinguished CXR LED could mean:
 - no carrier is being received or it is being applied at improper levels
 - CXR LED is blown
 - the SQUELCH adjust is set improperly
 - the carrier receiver is malfunctioning
 Improper functioning will inhibit any audio output from the 412 DEMOD.
- c. Squelch is factory set to - 50dBm and in most cases will not require adjustment. However, if the carrier level is too low and the carrier indicator light will not light, squelch may be adjusted from the front panel using a screwdriver. Use the following procedure:

1. Tune DEMOD to a known active channel.
 2. If CXR light is OFF, adjust SQUELCH counterclockwise until CXR is ON.
 3. With CXR light ON, adjust SQUELCH clockwise to the point that the CXR light just turns OFF. This is the DEMOD squelch threshold.
 4. Tune DEMOD to an unused channel (i.e. no RF carrier).
 5. **IMPORTANT — COUNT TURNS THIS STEP:** Turn SQUELCH counterclockwise until CXR light just comes on due to RF noise.
 6. Turn SQUELCH clockwise *one - half* the number of turns in Step 5.
 7. Return to an operating channel.
- The DEMOD is now adjusted to squelch at a level halfway between the operating carrier and the RF noise floor.

NOTE: *If the squelch setting is too low there will be no effect on normal program reception. However, in the absence of a carrier (prior to program material or if the DEMOD is tuned to an inactive channel) the CXR indicator may be ON or may flash due to input noise. In this case, CXR ON does not necessarily mean that there is noise on the channel. Only if the AFC indicator also remains ON would there be noise on the channel. (It is likely that the AFC indicator will go out because of a lack of a fixed carrier to lock onto. In this case there would be no noise on the channel.)*

- AFC**
- a. The AFC LED should always be glowing.
 - b. An extinguished LED could mean:
 - the AFC LED is blown
 - the carrier being received is unstable in frequency (more than ± 80 kHz from channel center)
 - the 412 DEMOD AFC circuitry is malfunctioning
 - squelch is set too low and no CXR is present on the channel
- Improper functioning will inhibit any audio output from the 412 DEMOD.

Audio Output Level

- a. Hook a high impedance ($>10k$ ohms) AC voltmeter to 412 DEMOD through PGM front panel jack, or through the associated audio terminal block on backplane.
- b. Have 412 MOD site send a 1000 kHz continuous test tone at the unaffected level (43.8 kHz peak deviation)
- c. AC voltmeter should read $+ 4$ dBm ± 0.1 dB.
- d. Adjustment to LEVEL should be made until this reading is obtained.
- e. Reading at the front panel and backplane should agree within ± 0.1 dB.

3.05 Storage and Reshipment

The 412 DEMOD can be stored for an indefinite period if protected from dust, moisture, and severe temperature extremes. For complete protection in storage, wrap the 412 DEMOD assembly in a moisture-proof material to protect equipment from dust and moisture. Include a package of dessicant inside wrapping. Observe the environmental limitations for storage indicated in Section 1.03, Table 1.

For long term storage or shipment, place modules in an anti-static bag. Do *not* use bubble-pack for this wrapping. Use ethafoam pads, or similar material to block the 412 DEMOD shelf within its box. Pack securely so equipment cannot shift within box during handling or shipment. Include a package of dessicant material in box.

Place all pertinent documents in a waterproof bag and attach this bag to wrapped assembly. Seal the box.

Mark box FRAGILE, ELECTRONIC EQUIPMENT, and indicate top of box with a red arrow.

SECTION 4 OPERATION OF 412 DEMOD

Para Contents

- 4.01 Controls and Indicators
- 4.02 Turn-on Procedure
- 4.03 Operating Procedure
- 4.04 Turn-off Procedure
- 4.05 Emergency Operation

4.01 Controls and Indicators

Table 5 lists and describes the function of all user operated controls and indicators located on the front panel of the 412 DEMOD modules. *Internal controls and test points should not normally be accessed by user personnel.* Procedures required for alignment and/or repair are described in Section 5 - Maintenance. Controls and indicators for the 412 DEMOD power supply module are covered in Table 7.

TABLE 5		
412 DEMOD CONTROLS AND INDICATORS (See Figure 7 for 412 DEMOD Front Panel Detail)		
Front Panel Designation	Description	Function
CXR	Yellow LED	ON indicates Channel carrier is present at the expected channel frequency ± 150 kHz. OFF indicates carrier not present (or LED broken, power off, DEMOD malfunction, etc. Flickering may indicate failing carrier or CNR which is very low.
AFC	Yellow LED	ON - In the presense of a carrier, ON indicates a stable carrier frequency (within ± 80 kHz). When a carrier is not present, ON indicates that the internal frequency control circuitry is operating properly. Flickering indicates intermittent carrier frequency stability problems. OFF - either indicates carrier instability (greater than ± 80 kHz), DEMOD malfunction, or a squelch setting that is too low with no carrier present in the channel.
CHANNEL ACTIVE	2-segment LED digital display	Displays operating channel number. This number may be different than that shown on thumbwheel switch

Table continued on next page \longrightarrow

TABLE 5, Continued

		"CHANNEL SELECT" if "EXECUTE" button has not been pushed since changing switch, or if channel selection is done remotely.
CHANNEL SELECT (Manual)	Thumbwheel selector switch	Used to locally (and manually) change the operating channel. Choices are only 1 through 12. Table 6 shows the corresponding RF frequencies.
EXECUTE	Black pushbutton	Activates Channel selection function. Operation will shift to channel number indicated on CHANNEL SELECT switch when depressed.
REMOTE -DISABLE -ENABLE	2-position toggle switch	Controls remote control execution. With switch in DISABLE channel selection and execute function can be made only from the 412 DEMOD front panel. With switch in ENABLE channel selection and execute can be made remotely or manually from front panel.
LEVEL	Screwdriver control	Used to set audio program output level of the 412 DEMOD. Level is set in factory at +4 dBm at average program level (APL) and +18 dBm at peak program level (PPL). This control yields ± 6 dB variation.
SQUELCH	Screwdriver control	Used to set actual squelch circuitry activation point. Factory set so that squelch will occur when RF input to shelf is -50 dBm. Range of adjustment is -80 to -30 dBm RF input to shelf.
SENS	Screwdriver control	Used with ZERO to set external metering sensitivity. Used to set desired meter deflection for given level of carrier level change. Factory set so that .8 to 9 volts at -40 dBm RF input to shelf.
ZERO	Screwdriver control	Used similarly to SENS. Factory set so that 0 volts reading is obtained at -70 dBm RF input. Both SENS and ZERO are system aides in fine tuning the total receive system.

Table continued 

PGM	Test jack accommodating standard telephone plug	Allows monitoring of expanded audio output signal for level-setting purposes. Designed for use with high impedance (>10k ohms) meter. Reading should agree with audio output measured at backplane $\pm .1$ dB.
DET	Test jack accommodating standard telephone plug	Allows monitoring of unexpanded audio. Typically used to measure and set unaffected level point. Unaffected level is factory set at +4 dBm $\pm .3$ dB.



Figure 7. Model 412 DEMOD Front Panel Detail.

TABLE 6
412 DEMOD CHANNEL FREQUENCIES

CHANNEL NUMBER	RF FREQUENCY (MHz)
1	75.3
2	74.6
3	74.2
4	72.8
5	72.5
6	71.9
7	68.3
8	67.7
9	67.4
10	66.0
11	65.6
12	64.9

TABLE 7
412 DEMOD POWER SUPPLY CONTROLS
AND INDICATORS

(See Figure 8 for 412 Power Supply Front Panel Detail)

FRONT PANEL DESIGNATION	DESCRIPTION	FUNCTION
+ 5 Vdc	Red test point	All RED tests points provided to monitor various power levels existing within the 412 DEMOD. GND provided to be used in measurement of each.
+22 Vdc	Red test point	
+15 Vdc	Red test point	
-15 Vdc	Red test point	
GND	Black test point	All voltages should be accurate to + .5, -0, except the +22 which can be within +18 to +32 Vdc.
POWER	Yellow LED	ON indicates power is being supplied to shelf. OFF indicates power not being supplied to shelf, LED broken, or power supply malfunction.

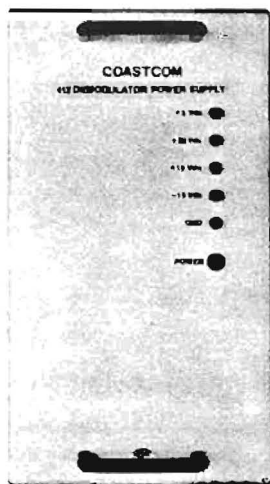


Figure 8. Model 412 DEMOD Power Supply Front Panel Detail.

pushing the EXECUTE button will cause switching to occur in less than 100 ms.

If remote control inputs are to be used for channel switching, then virtually no operator attendance is required.

TABLE 8
NORMAL OPERATIONS 412 DEMOD

FRONT PANEL CONTROL/INDICATOR	NORMAL OPERATING CONDITIONS 412 DEMOD
CXR (LED)	Glowing
AFC (LED)	Glowing
CHANNEL SELECT	1 thru 12
CHANNEL ACTIVE	= Channel Select
REMOTE - ENABLE	Optional
- DISABLE	

4.04 Turn-off Procedure

Power is removed from the 412 DEMOD by pulling the power plug or turning off the power source to the 412 DEMOD shelf.

4.05 Emergency Operation

In the case of a power failure as indicated by the Power LED being extinguished, the fuse of the 412 DEMOD power supply should be checked. If either the CXR or AFC LED's on the 412 DEMOD become extinguished, it will be necessary to troubleshoot the 412 DEMOD module according to the procedures of Section 6 - Maintenance.

If there is a backup 412 DEMOD already in the shelf, program reception can continue by switching the backup unit to the proper channel.

SECTION 5 DIAGRAMS OF 412 DEMOD

The following engineering drawings are included to support operation, maintenance and theory of operation of the 412 DEMOD:

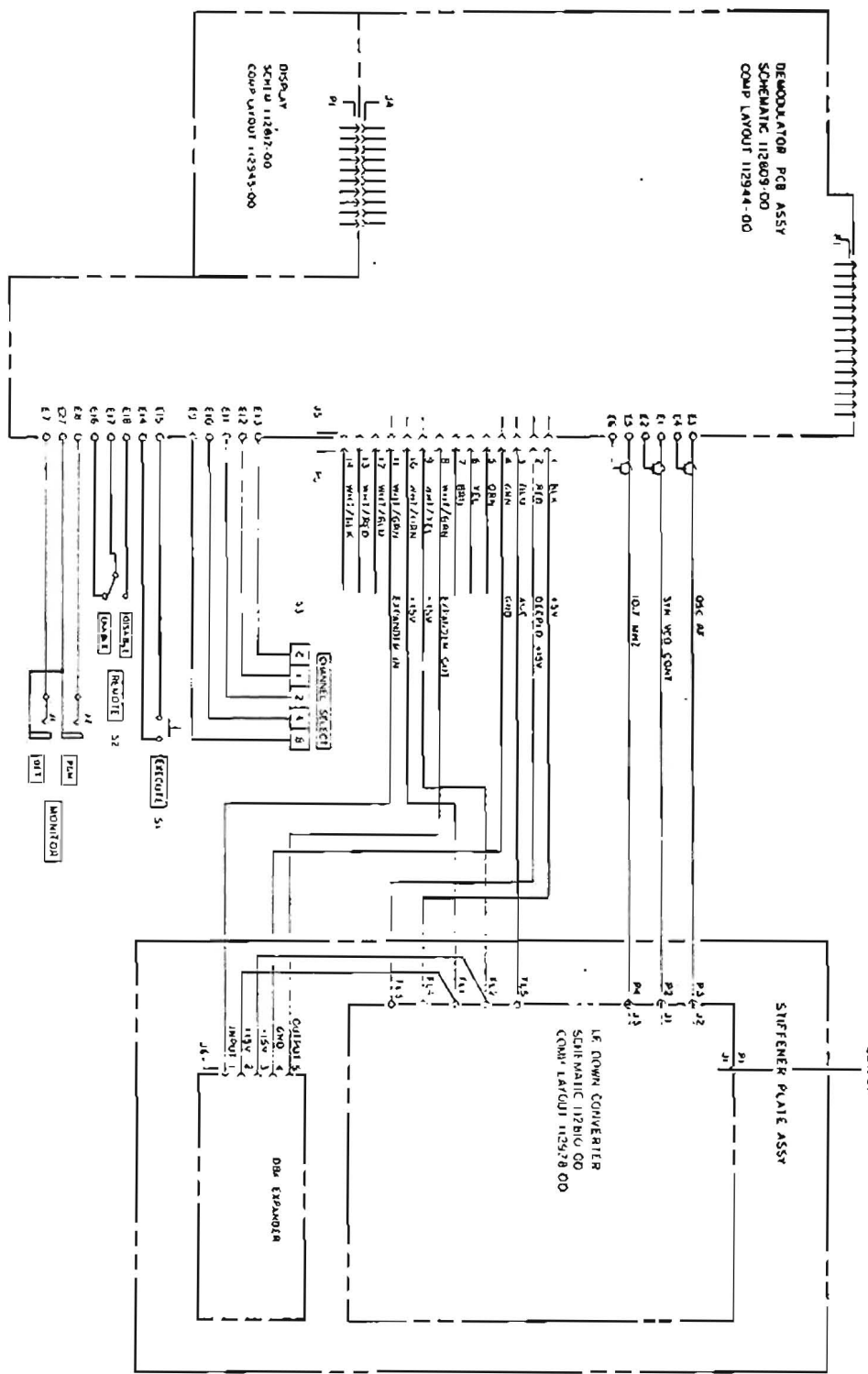
<i>Schematic Diagrams</i>	<i>Drawing No.</i>
Interconnect Wiring Diagram	D113011-00A
Demodulator (2 sheets)	D112809-00B
IF Down Converter	D112810-00C
Power Supply	C113015-00B
Backplane	C113012-00A
Display Logic	B112812-00A
 <i>Component Layout Diagrams</i>	
Demodulator	D112944-00A
IF Down Converter	C112928-00C
Power Supply	D112946-00B
Backplane	D112925-00B
Display	B112945-00A

4.02 Turn-on Procedure

There is no additional turn-on procedure for the 412 DEMOD once the connections described in Section 3.03 are made and the initial tests are made as described in Section 3.04.

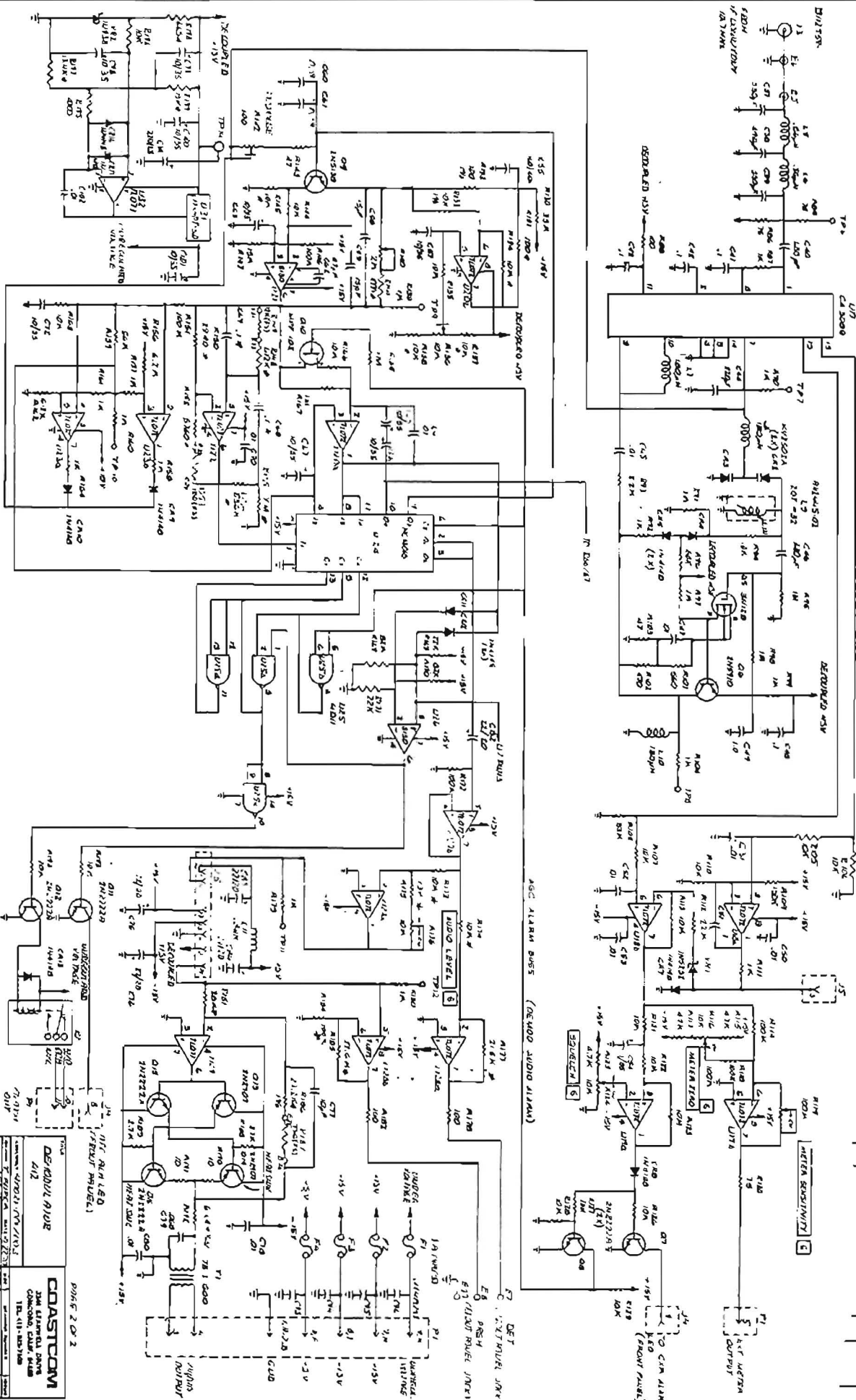
4.03 Operating Procedure

After initial setup, the 412 DEMOD is normally operated in an unattended mode. Table 8 indicates normal operational settings for the 412 DEMOD. The 412 DEMOD power supply requires no operator interaction whatsoever. The most likely interaction with the 412 DEMOD is in selecting a new channel of operation. This involves dialing the thumbwheel CHANNEL SELECT switch to the new desired channel. Once this is done, and switching is desired from the old channel,



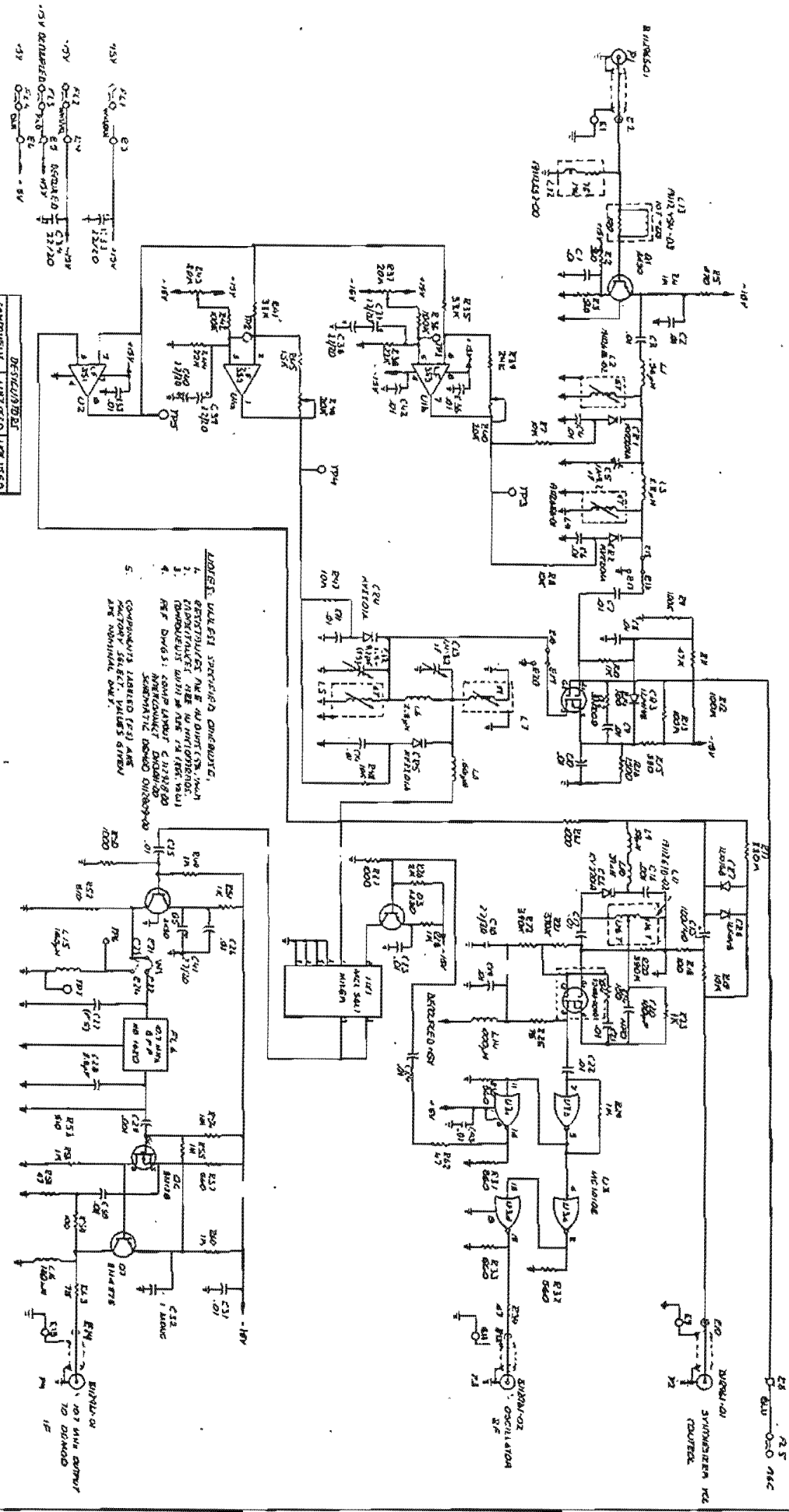
2 IN 1 ONE DEMOD UNIT ASSY 112934-00
BACKPLANE SCHEMATIC 112914-00
NOTES UNLESS OTHERWISE SPECIFIED

INTRACONNECT AIRBORNE DIAGRAM DEVEN 412 UNIT ASSY	
COASTCOM 112011-00	A



REVISIONS	
NO.	DESCRIPTION
1	ASSEMBLED
2	REWORKED
3	REWORKED
4	REWORKED
5	REWORKED
6	REWORKED
7	REWORKED
8	REWORKED
9	REWORKED
10	REWORKED

COASTCOM
 2046 2 OF 2
 DEPT. 4102
 412
 1/2 309-70
 TEL: (41) 309-700



- NOTE: USE ESI SPECIFIED COMPONENTS.
1. RESISTORS ARE ADJUSTABLE.
 2. CAPACITORS ARE IN MICROFARADS.
 3. COMPONENTS WITH * ARE IN (SERIAL).
 4. REF DIMS: COMP LAYOUT SPECIFIED.
 5. COMPONENTS LABELED (C) ARE IDENTICAL TO VALUES GIVEN AND OMITTED DIMS.

COMPONENT	TYPE	VALUE	USED
RESISTOR	R1-R100	VAR	314
CAPACITOR	C1-C100	VAR	314
TRANSFORMER	T1, T2	VAR	314
DIODE	D1-D10	VAR	314
VALVE	V1-V10	VAR	314
SWITCH	S1-S10	VAR	314
POTENTIOMETER	P1-P10	VAR	314
RELAY	R1-R10	VAR	314
OTHER	OT	VAR	314

REV	DATE	BY	CHKD
1	11/28/10	00	00

COASTCOM

IF DOWN CONTACT
SCHEMATIC

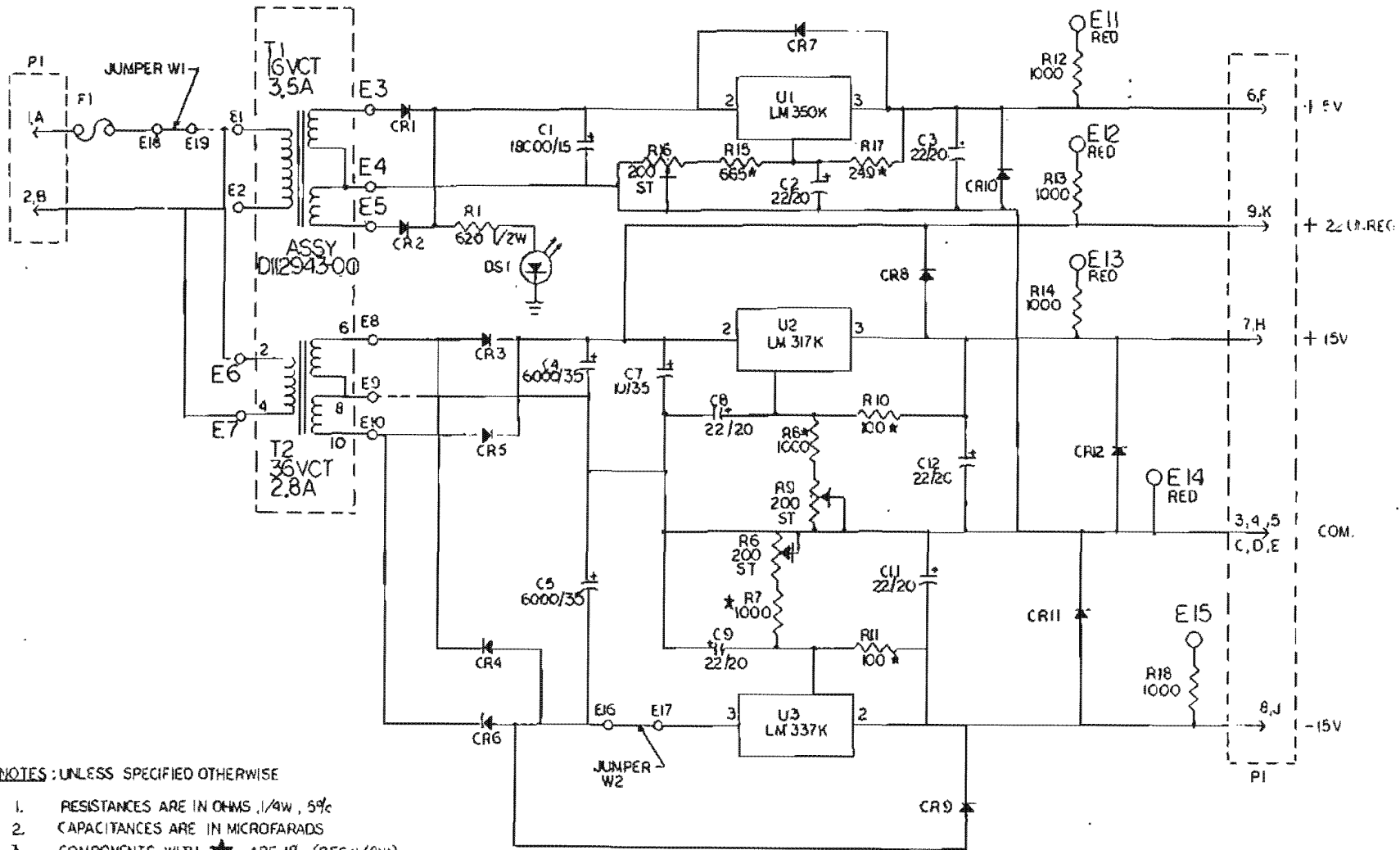
DATE: 11/28/10

TIME: 11:28:00

FILE: 112810-00

STATUS: C

REVISIONS			
REVISION	DESCRIPTION	DATE	APPROVED
B	ECO 400-169	8-2-79	TCUJ



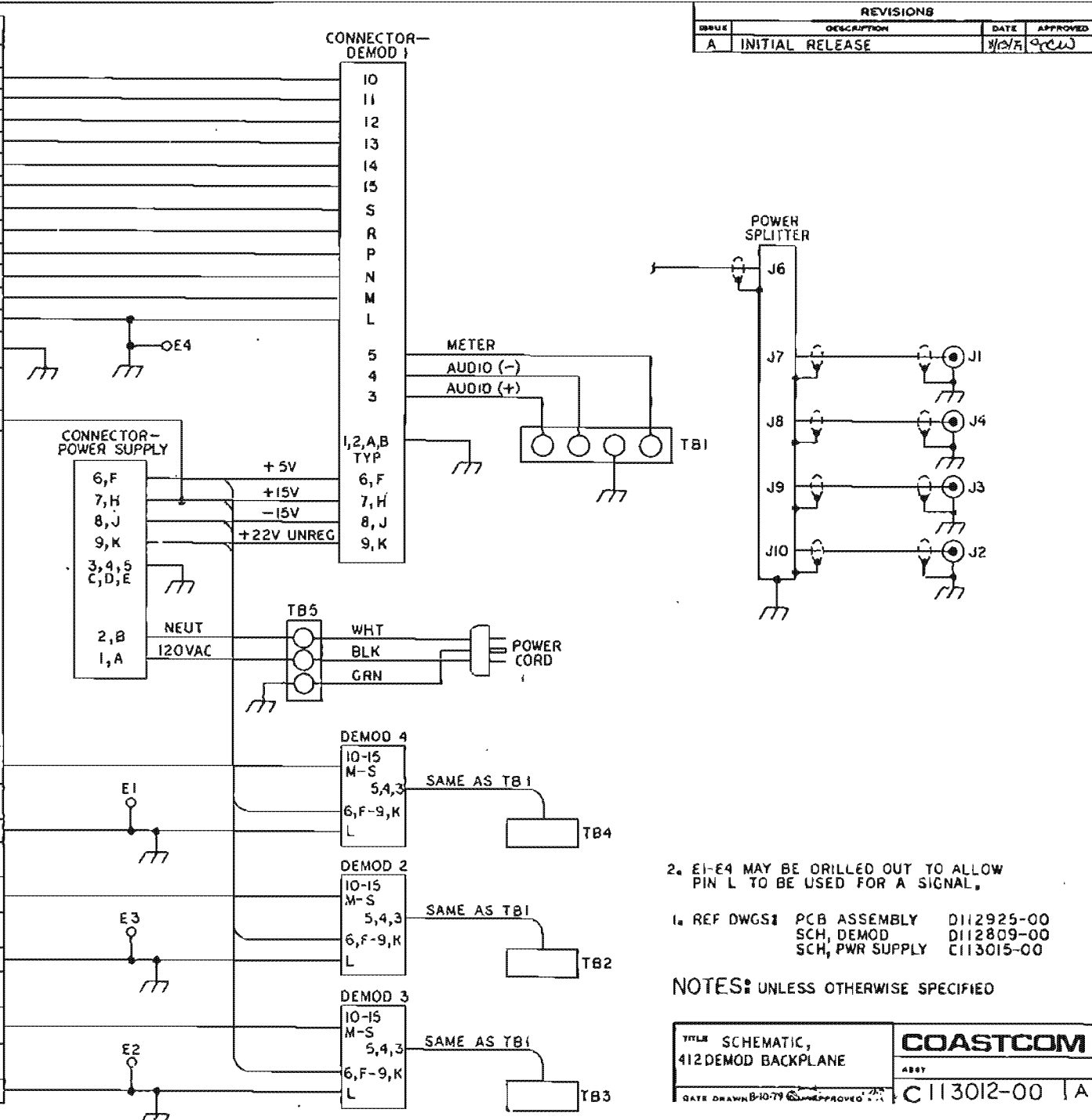
NOTES: UNLESS SPECIFIED OTHERWISE

1. RESISTANCES ARE IN OHMS, 1/4W, 5%
2. CAPACITANCES ARE IN MICROFARADS
3. COMPONENTS WITH ★ ARE 1% (RES: 1/8W)
4. CR1-6 ARE MR 751
5. CR7-12 ARE IN4001

DESIGNATOR		
COMPONENT	LAST USED	NOT USED
RESISTOR	R 18	R 2,3,4,5
CAPACITOR	C 13	C 6,10,12,13
DIODE	CR 12	
INTEGRATED	U 5	U 4

POWER SUPPLY	COASTCOM
412 DEMOD	
DATE DRAWN 7-2-79	ASSY 40026-CO1/C52
APPROVED	C 113015 CC B

J5 PIN ASSIGNMENTS	
PIN	FUNCTION
1	DEM0D 1 ALARM RELAY
2	DEM0D 1 ALARM RELAY
3	DEM0D 1 OUTPUT 2 ³ BIT-MSB
4	DEM0D 1 OUTPUT 2 ² BIT
5	DEM0D 1 OUTPUT 2 ¹ BIT
6	DEM0D 1 OUTPUT 2 ⁰ BIT-LSB
7	DEM0D 1 INPUT 2 ⁰ BIT-LSB
8	DEM0D 1 INPUT 2 ¹ BIT
9	DEM0D 1 INPUT 2 ² BIT
10	DEM0D 1 INPUT 2 ³ BIT-MSB
11	DEM0D 1 REMOTE EXECUTE
12	GROUND (SPARE)
13	GROUND
38	+ 2V
14-24	DEM0D 4 SAME FUNCTIONS AS PINS 1-11
25	GROUND (SPARE)
27-37	DEM0D 2 SAME FUNCTIONS AS PINS 1-11
26	GROUND (SPARE)
40-50	DEM0D 3 SAME FUNCTIONS AS PINS 1-11
39	GROUND (SPARE)



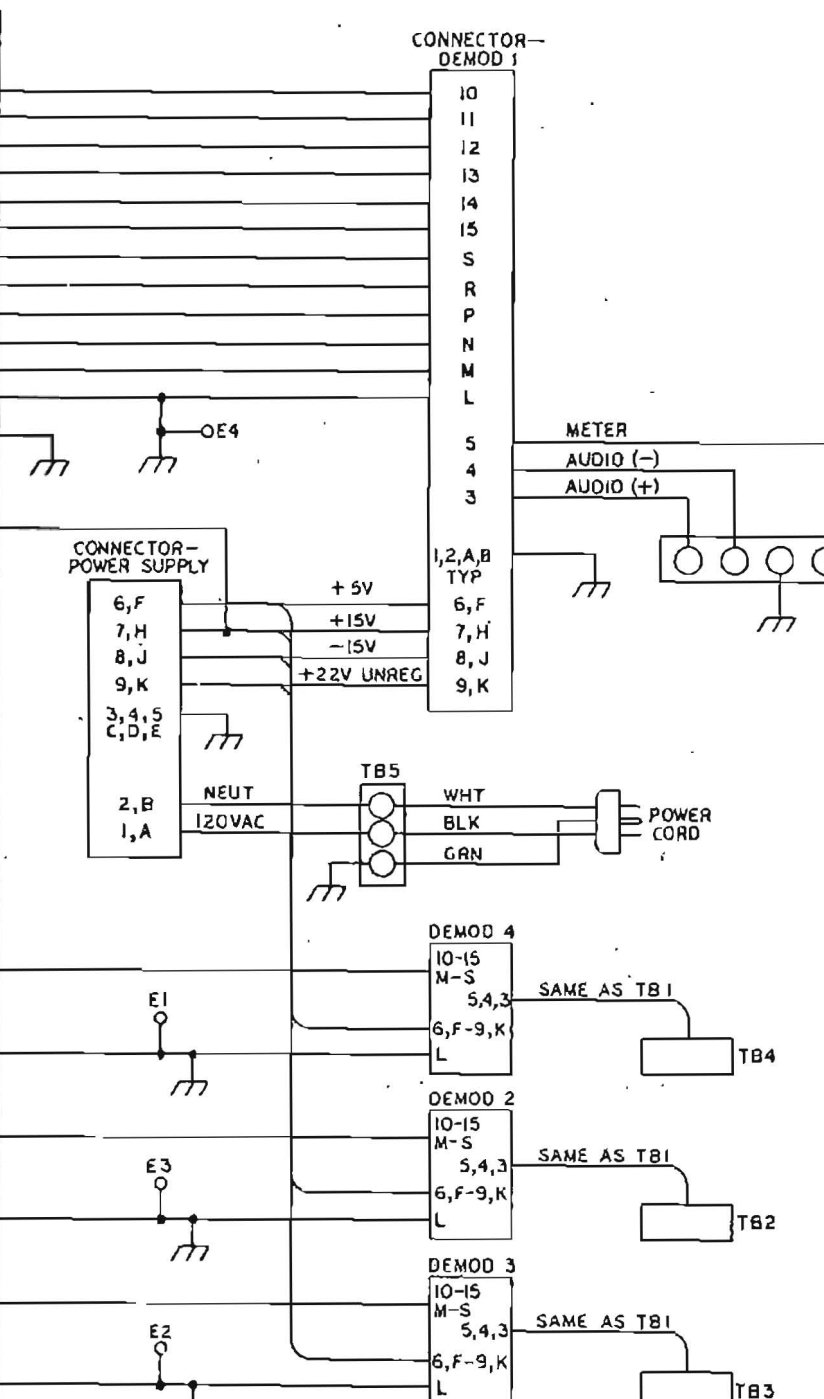
REVISIONS			
DDU#	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	11/27/77	RCW

- 2. E1-E4 MAY BE DRILLED OUT TO ALLOW PIN L TO BE USED FOR A SIGNAL.
- 1. REF DWGS: PCB ASSEMBLY D112925-00
SCH, DEMOD D112809-00
SCH, PWR SUPPLY C113015-00

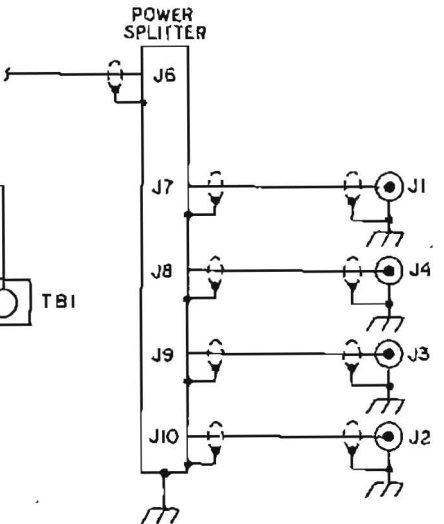
NOTES: UNLESS OTHERWISE SPECIFIED

TITLE	SCHMATIC, 412 DEMOD BACKPLANE	COASTCOM
DATE	DRAWN B-10-79	
DATE	DRAWN B-10-79	C 113012-00 A

J5 PIN ASSIGNMENTS	
PIN	FUNCTION
1	DEM0D 1 ALARM RELAY
2	DEM0D 1 ALARM RELAY
3	DEM0D 1 OUTPUT 2 ³ BIT-MSB
4	DEM0D 1 OUTPUT 2 ⁴ BIT
5	DEM0D 1 OUTPUT 2 ¹ BIT
6	DEM0D 1 OUTPUT 2 ⁰ BIT-LSB
7	DEM0D 1 INPUT 2 ⁰ BIT-LSB
8	DEM0D 1 INPUT 2 ¹ BIT
9	DEM0D 1 INPUT 2 ⁴ BIT
10	DEM0D 1 INPUT 2 ³ BIT-MSB
11	DEM0D 1 REMOTE EXECUTE
12	GROUND (SPARE)
13	GROUND
38	+12V
14-24	DEM0D 4 SAME FUNCTIONS AS PINS 1-11
25	GROUND (SPARE)
27-37	DEM0D 2 SAME FUNCTIONS AS PINS 1-11
26	GROUND (SPARE)
40-50	DEM0D 3 SAME FUNCTIONS AS PINS 1-11
39	GROUND (SPARE)



REVISIONS			
ISSUE	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	8/10/75	PCW

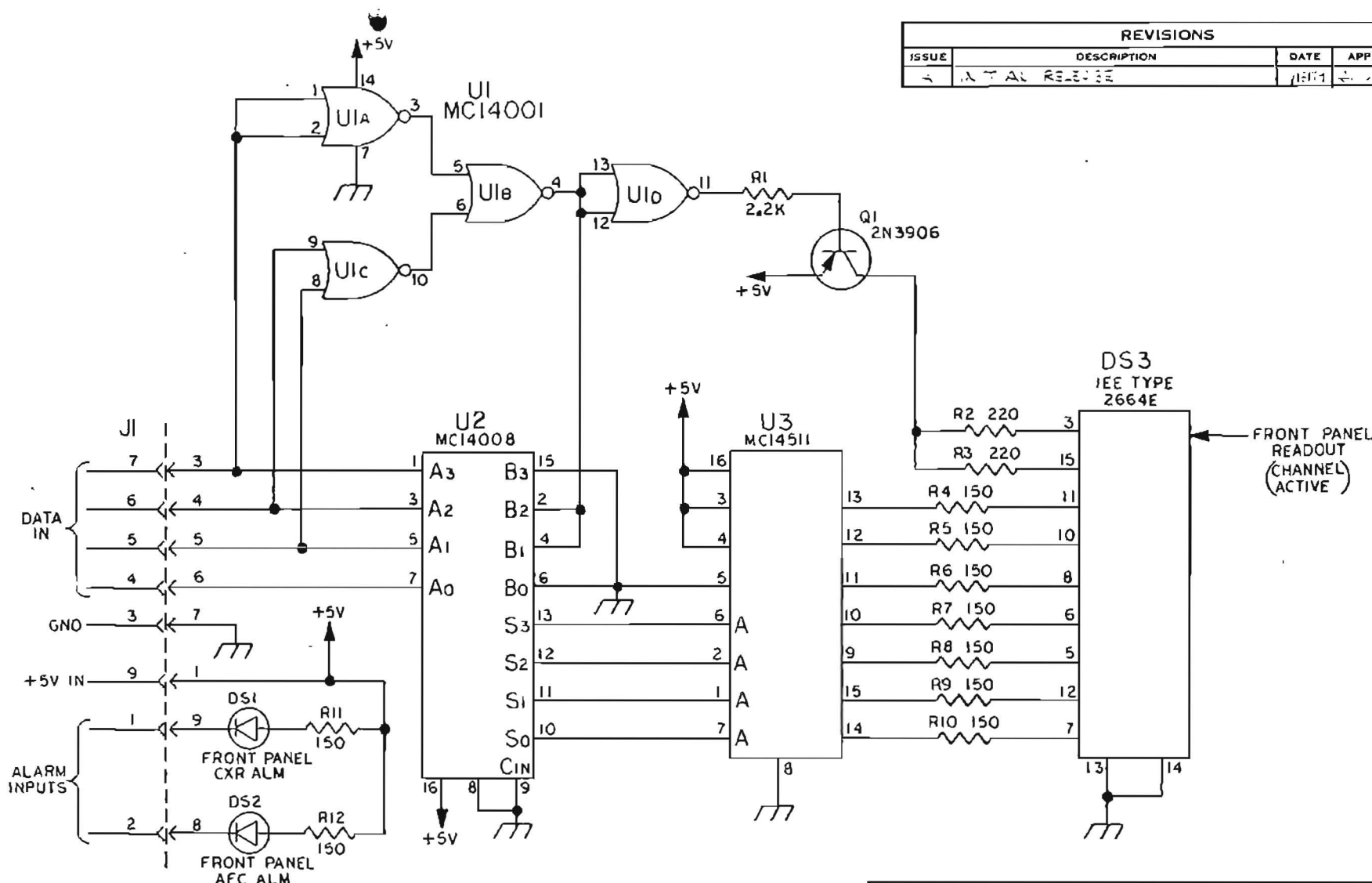


2. EI-E4 MAY BE DRILLED OUT TO ALLOW PIN L TO BE USED FOR A SIGNAL.

1. REF DWGS: PCB ASSEMBLY D112925-00
 SCH, DEMOD D112809-00
 SCH, PWR SUPPLY C113015-00

NOTES: UNLESS OTHERWISE SPECIFIED

TITLE SCHEMATIC, 412 DEMOD BACKPLANE	COASTCOM
DATE DRAWN: 8-10-75	APPROVED: [Signature]
C113012-00	1A

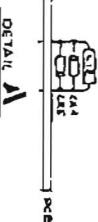
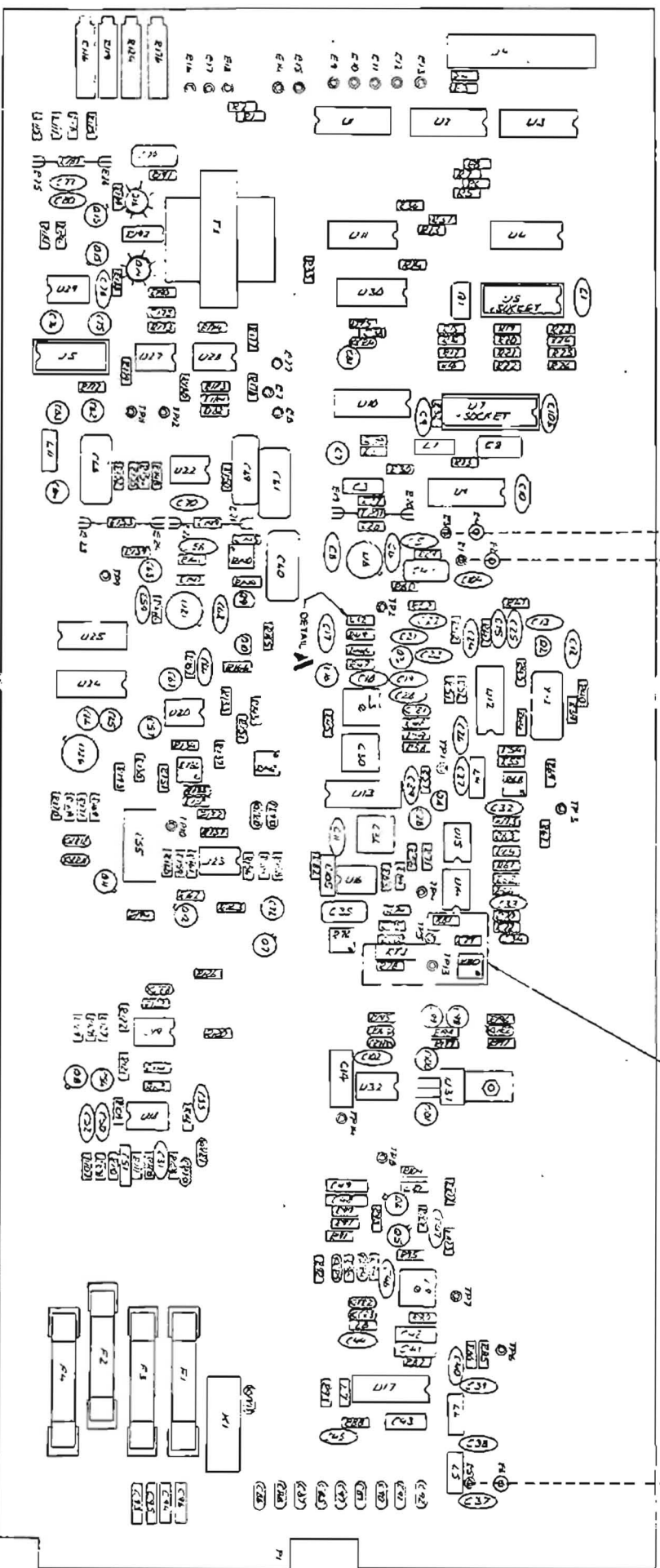


REVISIONS			
ISSUE	DESCRIPTION	DATE	APPROVED
1	INITIAL RELEASE	1/18/71	

1. DS1 AND DS2 ARE HP5082-4555
 NOTES: UNLESS OTHERWISE SPECIFIED

2. REF DWGS: COMP LAYOUT B113033
 SCHEM, SYNTH D113016
 SCHEM, INTFCE D112979
 WIRING DIA D113014

TITLE SCHEMATIC DISPLAY LOGIC 412 MOD AND DEMOD		COASTCOM
DATE DRAWN 6-7-79		
APPROVED	3/2/14 SDJ SPLAK	ASSY.
8		112812-00
		A



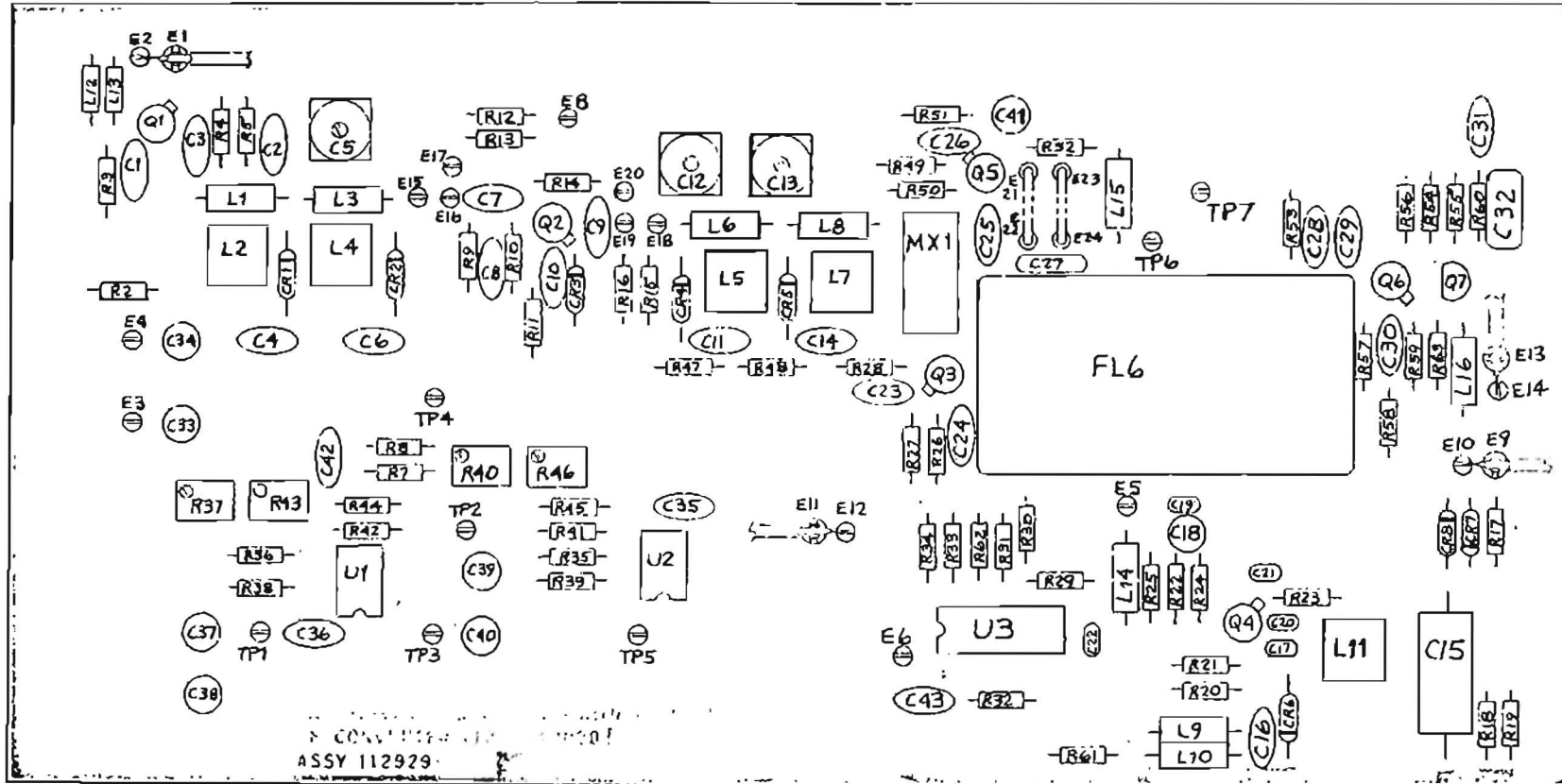
NOTES
 1. CHECK DIMENSIONS SPECIFIED
 2. DELETE COMPONENTS UNLESS BOXED
 3. INSTALL COMPONENTS UNLESS BOXED
 4. PCB ASSY DIRBBI
 5. SACRAMENTO DIVISION
 6. FABRICATION DIVISION

NOTE 1

DATE	BY	REVISION

COASTCOM
 11224004-0001
 11224004-0002
 11224004-0003
 11224004-0004
 11224004-0005
 11224004-0006
 11224004-0007
 11224004-0008
 11224004-0009
 11224004-0010
 11224004-0011
 11224004-0012
 11224004-0013
 11224004-0014
 11224004-0015
 11224004-0016
 11224004-0017
 11224004-0018
 11224004-0019
 11224004-0020
 11224004-0021
 11224004-0022
 11224004-0023
 11224004-0024
 11224004-0025
 11224004-0026
 11224004-0027
 11224004-0028
 11224004-0029
 11224004-0030
 11224004-0031
 11224004-0032
 11224004-0033
 11224004-0034
 11224004-0035
 11224004-0036
 11224004-0037
 11224004-0038
 11224004-0039
 11224004-0040
 11224004-0041
 11224004-0042
 11224004-0043
 11224004-0044
 11224004-0045
 11224004-0046
 11224004-0047
 11224004-0048
 11224004-0049
 11224004-0050
 11224004-0051
 11224004-0052
 11224004-0053
 11224004-0054
 11224004-0055
 11224004-0056
 11224004-0057
 11224004-0058
 11224004-0059
 11224004-0060
 11224004-0061
 11224004-0062
 11224004-0063
 11224004-0064
 11224004-0065
 11224004-0066
 11224004-0067
 11224004-0068
 11224004-0069
 11224004-0070
 11224004-0071
 11224004-0072
 11224004-0073
 11224004-0074
 11224004-0075
 11224004-0076
 11224004-0077
 11224004-0078
 11224004-0079
 11224004-0080
 11224004-0081
 11224004-0082
 11224004-0083
 11224004-0084
 11224004-0085
 11224004-0086
 11224004-0087
 11224004-0088
 11224004-0089
 11224004-0090
 11224004-0091
 11224004-0092
 11224004-0093
 11224004-0094
 11224004-0095
 11224004-0096
 11224004-0097
 11224004-0098
 11224004-0099
 11224004-0100

REVISIONS			
ISSUE	DESCRIPTION	DATE	APPROVED
B	ECO # 400-162, 400-181, 400-182	2-3-79	AF
C	ECO # 400-183 CHANGED TO REV 'C' TO TRACE	9-9-79	10p



1. REF DWGS: PCB ASSY D112929-00
SCHEMATIC D112810-00
FABRICATION C112931-00 REV C

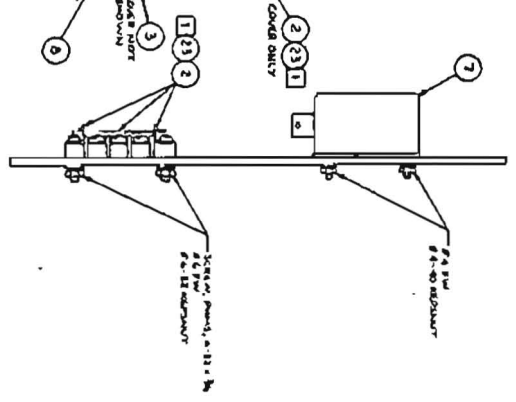
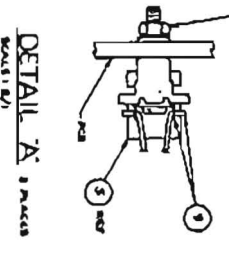
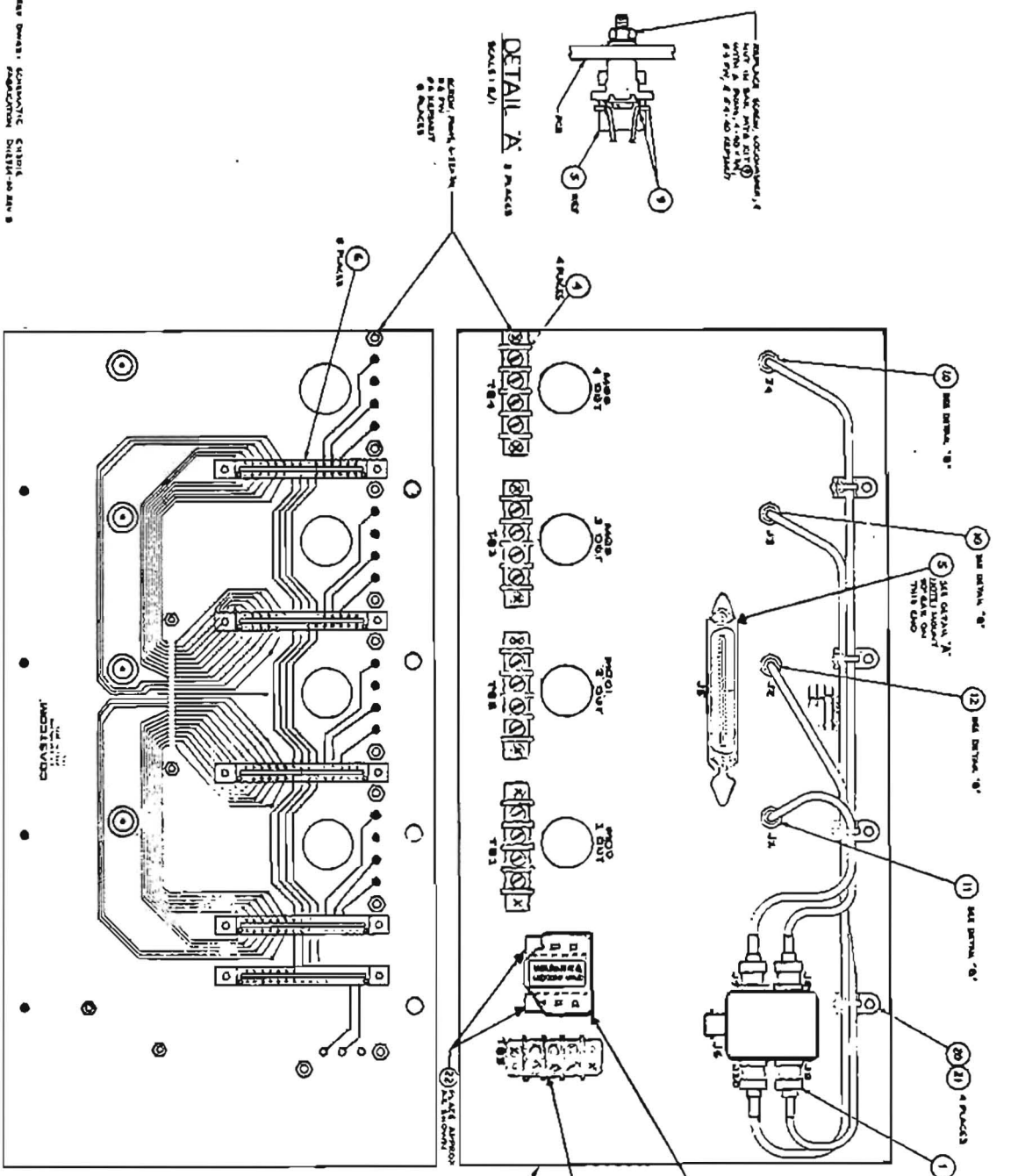
NOTES: UNLESS OTHERWISE SPECIFIED

TITLE COMPONENT LAYOUT IF CONVERTER	COASTCOM
DATE DRAWN: 7-11-79	APPROVED: AF
ASSY C 112928-00	C

4. SEE PARTS, CONDUCTIVE ELEMENT
 FABRICATION DRAWING DATED 10-20-58

5. APPLY MOUNTING LABEL ② TO COVER ③ AS SHOWN.
 THESE CONNECTION LEADS SHOULD BE ALIGNED TO LEAD TO LOW PART.

NOTES: UNLESS OTHERWISE SPECIFIED



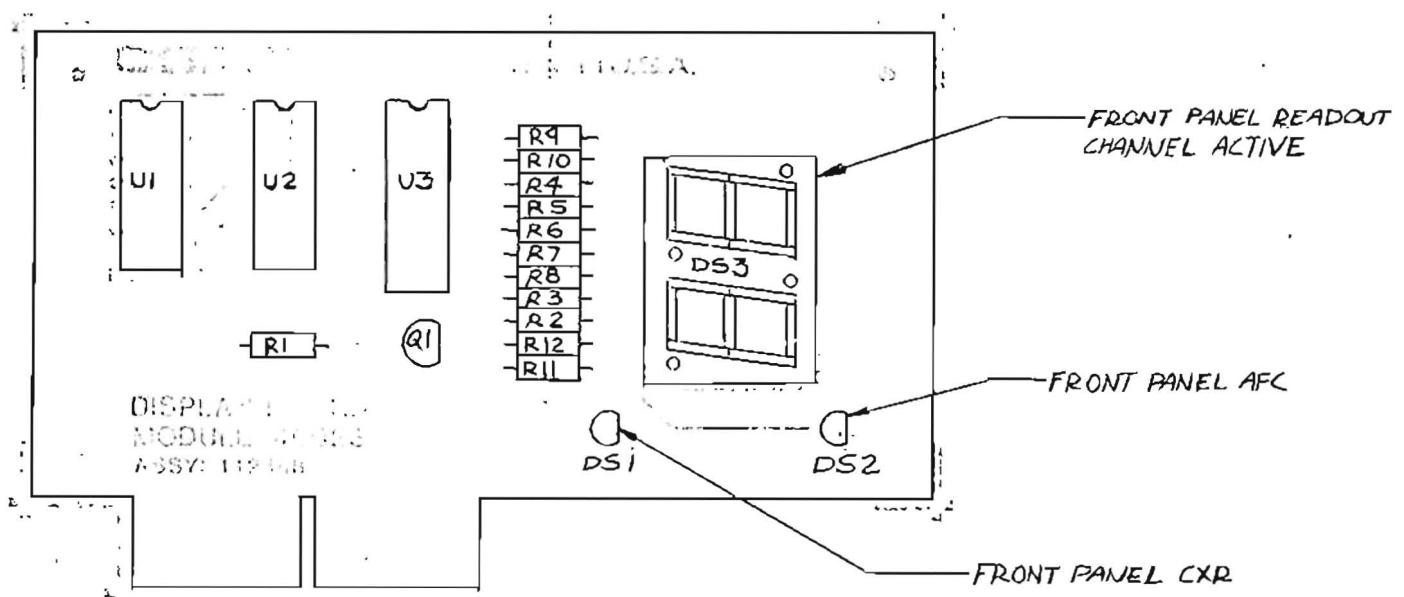
REV	DATE	BY	CHKD	DESCRIPTION
1	10-20-58			ISSUE FOR FABRICATION
2	11-10-58			REVISION

412 OAK PLANE DEMODULATOR

COASTCOM

0 112925-00 1 B

REVISIONS			
SYN.	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE	7/27/79	T.C.W.



NOTES: UNLESS OTHERWISE SPECIFIED

- 1 REF. DWGS:
- SCHMATIC B 112812-00
- PCB ASSY C 112888-00

MATERIAL		FINISH		HEAT TREAT	
DIMENSIONAL TOLERANCES UNLESS OTHERWISE NOTED		TITLE		WEIGHT	
FRACTIONAL	DEC.	ANG.	412 DEMODULATOR DISPLAY		COASTCOM
\pm	\pm	\pm			
SCALE	NO. RECD.	DRAWN	DATE	SIZE	DRAWING NUMBER
2X		DINH PHAM	7-18-79	B	112945-00
NEXT ASSY:		CHECKED	DATE	ISSUE	
0112938-00		LAC	7-27-79	A	
		APPROVED	DATE		
		T. WARREN	7/27/79		

SECTION 6 MAINTENANCE OF 412 DEMOD

Para. Contents

- 6.01 General
- 6.02 Test and Alignment
- 6.03 Troubleshooting
- 6.04 Repair
- 6.05 Replacement Parts List

6.01 General

a. Maintenance Concept

The maintenance concept for the 412 DEMOD is to fault isolate to a faulty module, remove and replace the module. It is recommended that the module not be repaired in the field, but be returned to COASTCOM for repair and realignment. Factory rework is performed by COASTCOM at a cost determined by repair and return procedures and is subject to the conditions of COASTCOM's product warranty. A RETURNED UNIT AUTHORIZATION must be obtained before returning a module to the factory. Authorization can be obtained by telephone, TWX or mail. Contact:

COASTCOM
2312 Stanwell Drive
Concord, CA 94520
Phone: (415) 825-7500
TWX: (910) 481-5781

Attn: Customer Returned Goods

b. Precautions

If adequate test equipment is not available to test and troubleshoot the 412 DEMOD, it is then recommended that the complete assembly be returned to the factory for repair.

WARNING

Low voltage DC circuits are not normally considered dangerous. However, short circuits in low impedance DC circuits can cause large flashes that may result in burns or damage to the eyes. Always remove rings and watches while working with primary voltage circuits. Avoid short-circuiting power terminals and power inputs to modules.

When specified, the maintenance procedures should be considered out-of-service procedures—

that is, if the procedure is performed on a unit in an operating path, traffic is interrupted. These procedures can always be performed when the system is in a nonoperating status.

c. Maintenance Log

A separate maintenance log for the 412 DEMOD is not required. Entries should be made in the system maintenance logs of any degradation in the 412 DEMOD with a detailed description of the maintenance performed to correct the discrepancy.

d. Routine Maintenance

No scheduled maintenance is recommended. However, the 412 DEMOD should be occasionally inspected for module security, dirt, and any deterioration that may result in a future failure.

e. Test Equipment

Table 9 lists the test equipment required to test and troubleshoot the 412 DEMOD. Equivalent test equipment may be substituted for the test equipment recommended. Maintenance personnel should be familiar with the operation of all test equipment used. Table 9 on next page.

6.02 Test and Alignment

The 412 DEMOD should be tested in its normal system configuration for proper operation. No field alignment is recommended. Field adjustments are limited *only* to those which can be made from the front panel of the 412 DEMOD. These are described in Section 4.01 - Controls and Indicators. Whenever all normal system level test results are obtained, the 412 DEMOD should be considered operational. In addition, whenever the system level troubleshooting procedures indicate that the 412 DEMOD has failed, the 412 DEMOD should be fault isolated to a faulty module using the troubleshooting guidelines described below.

6.03 Troubleshooting

With the 412 DEMOD connected to power, and to input (RF) and output (audio) signals as instructed in Section 3.03, troubleshoot the suspected 412 DEMOD module in the following sequential manner:

1. Power supplied to shelf.

Is POWER LED glowing?

If **NO** - Check to be sure LED is not blown by testing front panel test point voltages. If these are all in spec, then probable that the LED is blown. If all voltages read zero, unplug power supply and

check fuse. If fuse is blown, replace. If not blown, be sure primary power source is delivering required power to 412 DEMOD backplane. If primary power is present and accurate, then the conclusion is a malfunctioning power supply.

If YES - Test voltage levels at front panel test points. If voltages are out of spec, power supply is malfunctioning. If voltages in spec, go to Step 2.

- 2. Power supplied to individual 412 DEMOD.**
 Unplug the 412 DEMOD and check all four fuses located near the rear of the module with an ohmmeter.
 If Fuse(s) Bad - Replace fuses, plug in the 412 DEMOD, and check module operation. If fuse(s) continue to blow, then 412 DEMOD is malfunctioning.
 If Fuse(s) Good - Plug in 412 DEMOD and go to Step 3.

- 3. Audio signal from 412 DEMOD.**
 Refer to Section 3.04.
- 4. RF signal from 412 DEMOD.**
 Refer to Section 3.04.
- 5. Channel Selection.**
 Refer to Section 3.04.
- 6. AFC Function.**
 Refer to Section 3.04.
- 7. Carrier Reception.**
 Refer to Section 3.04.

6.04 Repair

Repair is accomplished by replacing the defective module with a known good spare. It is recommended that the defective module be returned to the factory for repair.

6.05 Replaceable Parts List

Table 10 in a separate section following lists the replaceable parts for the Model 412 DEMOD.

Each list is headed by a title and a module number. The module number is the same as the PCB Assembly number listed on the corresponding layout drawing in Section 5.

TABLE 9
RECOMMENDED TEST EQUIPMENT

ITEM	TYPE	USED FOR TESTING of 412 DEMOD	
		DEMOM PWR. SUPPLY	DEMOM
Digital Multimeter	H.P. 3476A	X	X
AC Voltmeter	Fluke 8920A		X
RF Voltmeter	HP 3406A		X
Frequency Counter	Fluke 1910A		X
Audio Generator	Sound Technology 1710A		X
Calibrated Modulator	COASTCOM 412 MOD		X

TABLE 10
COASTCOM MODEL 412 DEMODULATOR REPLACEABLE PARTS LIST

Module: D112811-00 - PCB Assembly - REV B

PART NUMBER	QTY.	DESCRIPTION	DESIGNATION	PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
0470-0003	9	RESISTORS: 1/8W, 1% 10k	R83, 133, 134, 137, 138, 145, 173, 174, 199	0472-0073	28	10k	R27, 35, 42, 66, 67, 70, 72, 52, 58, 94, 105, 106, 107, 110, 113, 121, 122, 126, 127, 128, 129, 135, 144, 163, 166, 193, 194, 196 R147
0470-0009	1	100k	R184	0472-0077	1	15k	R5, 6, 7, 8, 13, 14, 36, 38, 168, 171,
0470-0013	1	7.5k	R84	0472-0081	12	22k	112, 195
0470-0033	1	2940	R150	0472-0085	3	33k	R74, 108, 130
0470-0040	1	22.6k	R183	0472-0087	1	39k	R62
0470-0041	1	23.2k	R186	0472-0089	5	47k	R1, 2, 3, 4, 48
0470-0046	1	28k	R181	0472-0091	1	56k	R159
0470-0059	1	1000 ohm	R141	0472-0095	3	82k	R63, 169, 170
0470-0072	1	665k	R198	0472-0097	16	100k	R9, 10, 11, 12, 29, 30, 31, 37, 61, 64, 71, 114, 118, 146, 172, 151
0470-0083	1	17.4k	R197	0472-0101	1	150k	R109
0470-0085	1	21.5k	R177	0472-0115	2	560k	R40, 47
0470-0098	2	5760 ohm	R75, 152	0472-0121	6	1M	R39, 46, 95, 98, 165, 167
0470-0100	1	13k	R175	0472-0132	1	10M	R123
0470-0101	2	100 ohm	R131, 132	0472-0093	4	Factory Select	R149, 153, 187, 201
0470-0102	1	2M	R155	0472-0014	3	10k POT	R116, 124, 176
0470-0104	1	412k	R148	0475-0016	1	100k POT	R119
0470-0108	1	536k	R154	0475-0026	1	100 ohm POT	R142
0470-0231	1	63.4 1/4W, 1%	R192	0475-0028	2	10k POT	R68, 136
0472-0001	2	1/4W, 5% 10 ohm	R190, 191	0475-0036	2	2k POT	R76, 140
0472-0017	2	47 ohm	R103, 143	0152-0012	1	100uF 40V	C55
0472-0019	1	56 ohm	R44	0152-0025	12	10uF 35V	C7, 57, 63, 65, 66, 67, 72, 81, 98, 99 100, 101
0472-0022	3	75 ohm	R85, 86, 120	0152-0026	7	22uF 20V	C16, 28, 75, 76, 82, 83, 84
0472-0025	4	100 ohm	R45, 88, 178, 182	0153-0003	2	82pF	C12, 13
0472-0041	1	470 ohm	R102	0153-0004	1	120pF	C18
0472-0043	4	560 ohm	R49, 53, 56, 101	0153-0006	2	220pF	C21, 44
0472-0046	1	750 ohm	R59	0153-0007	3	390pF	C19, 33, 38
0472-0049	24	1k	R28, 32, 33, 50, 54, 60, 87, 90, 91, 92, 97, 99, 104, 111, 139, 202 157, 158, 160, 161, 164, 179, 180, 195	0153-0014	1	.001uF	C2
0472-0051	1	1.2k	R55	0153-0016	1	.0015uF	C35
0472-0053	4	1.5k	R19, 20, 21, 22				
0472-0057	1	2.2k	R93				
0472-0059	2	2.7k	R188, 189				
0472-0065	7	4.7k	R15, 16, 17, 18, 115, 117, 125				
0472-0067	8	5.6k	R34, 41, 43, 51, 57, 69, 82, 193				
0472-0068	2	6.2k	R156, 162				
0472-0071	4	8.2k	R23, 24, 25, 26				

Module Parts List Continued in Next Column ➡

Module Parts List Continued on Next Page ➡

COASTCOM MODEL 412 DEMODULATOR REPLACEABLE PARTS LIST

PART NUMBER	QTY.	DESCRIPTION	DESIGNATION	PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
0153-0033	1	.22uF	C4	0313-0077	1	MC14519	U1
0153-0041	1	.01uF	C3	B112969-01	1	IC - Programmed	U5
0153-0061	1	.068uF	C79	0313-0080	1	MC14046	U13
0153-0051	2	.039uF 80V	C60, 61	0313-0085	1	MC14025 BCP	U11
0153-0057	2	330pF	C37, 39			TRANSISTORS:	
0153-0157	2	.1uF	C68, 69	0481-0007	1	MPS-U52	Q1
0152-0021	1	1uF 35V	C54	0481-0015	2	3N128	Q3, 5
0152-0015	1	220uF 25V	C14	0481-0018	2	MPF102	Q2, 10
0154-0002	1	10pF	C77	0481-0021	6	2N2222A	Q7, 8, 11, 12, 15, 16
0154-0004	1	33pF	C6	0481-0022	2	2N2907A	Q13, 14
0154-0005	1	47pF	C62	0481-0027	1	2N5910	Q6
0154-0010	2	15pF	C58, 59	0481-0017	2	2N5138	Q4, 9
0154-0108	4	680pF	C26, 27, 40, 46,			DIODES:	
0154-0109	11	.001uF	C34, 85, 86, 87, 88, 89, 90, 91, 92, 104, 97	0482-0004	12	IN4148	CR4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17
0154-0111	29	.01uF	C1, 5, 8, 9, 10, 15, 17, 20, 22, 23, 24, 29, 31, 45, 47, 50, 52, 53, 56, 64, 70, 71, 78, 80, 102, 103, 25, 32, 11	0482-0007	1	IN5232B Zener	VR1
0154-0112	10	.1uF	C41, 42, 43, 48, 51, 93, 94, 95, 96, 105	0482-0015	1	MV840	CR1
0154-0113	1	1.0uF	C49	0482-0043	1	KV2502 Matched Pair	CR2, 3
0154-0114	2	1.0uF	C30, 36	0482-0031	1	IN938 MOTOROLA	VR2
		SEMI CONDUCTORS: Integrated Circuits:		0180-0034	4	180uH	L7, 8, 10, 12
0313-0004	1	CA3089E	U17	0180-0050	1	470uH	L4
0313-0013	1	CD4011 MC14011CP	U25	0180-0038	2	.56uH	L5, 6
0313-0056	1	CA3080E	U14	0180-0040	1	1000uH	L1
0313-0028	1	MC1496P	U12			0180-0045	1
0313-0038	3	CA3130S	U8, 21, 26			68uH	L11
0313-0045	4	TL071CP	U15, 22, 29, 32	0280-0075	2	Heatsink for	Q14, 16
0313-0046	6	TL072CP	U18, 19, 20, 23, 27, 28	0210-0305	1	14 pin IC Socket	J5
0313-0051	1	MC14016	U24	0210-0320	29	Swage Term	E1, 3, 5, 7-18, 27, TP 1-12, 14
0313-0054	1	MC14017	U10	0210-0327	1	16 pin IC Socket	for U5
0313-0055	1	MC14001B	U30	0210-0349	3	Swage Term	E2, 4, 6
0313-0057	1	XR2209CP	U16	0210-0354	1	Connector 9 Pin	J4
0313-0058	1	CY775N	U7	0210-0357	1	18 pin IC Socket	for U7
0313-0061	1	MC10231	U9	0230-0250	1	3.7 MHz XTAL	Y1
0313-0062	1	MC14042	U2	0280-0076	8	Mini-Klip	E19-26
0313-0068	1	LM340T-5	U31	0450-0003	1	Relay	K1
0313-0076	2	MM74C902	U3, 4	0510-0024	4	Fuse 1A	F1-4
				0510-0016	8	Fuse Clip	

Module Parts List Continued in Next Column

Module Parts List Continued on Next Page

COASTCOM MODEL 412 DEMODULATOR REPLACEABLE PARTS LIST

PART NUMBER	QTY.	DESCRIPTION	DESIGNATION	PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
B112959-01	2	Cable ASSY	P1, 2	0472-0085	2	33k	R35, 41
B112959-02	1	Cable ASSY	P3	0472-0089	1	47k	R11
	1	4-40x 5/16PHMS		0472-0097	5	100k	R9, 12, 13, 36, 42
	1	#4 split washer		0472-0105	1	220k	R17
	1	4-40 Hex Nut		0472-0111	3	390k	R20-22
D112886-00	1	PCB Fab 40021		0472-0121	2	1M	R54, 55
		REFERENCE DWG:		0475-0035	4	20k Pot	R37, 40, 43, 46
D112809-00	A/R	Schematic				CAPACITORS:	
	R	Component		0151-0001	2	1.4-9.2pF VAR	C5, 13
D112944-00		Layout		0152-0012	1	100uF 40V	C15
		RESISTORS:		0152-0026	8	22uF 20V	C18, 33, 34, 37-41
		1/4W, 5% CF		0154-0001	1	3.3pF	C28
0472-0073	2	10k	R79, 81	0154-0012	1	100pF	C20
0472-0093	1	68k	R78	0154-0109	2	.001uF	C16, 29
0475-0028	1	10k, POT	R80	0154-0111	21	.01uF	C1-4, 6-11, 14, 23-26, 30, 31, 35, 36, 38, 42
0530-0001	1	Thermistor QA-51-J1	RT1	0154-0115	4	.01uF	C17, 19, 21, 22
0210-0320	1	Swage Term	TP1 ³	0154-0113	1	1uF	C32
		MISCELLANEOUS:				INTEGRATED CIRCUITS:	
				0313-0121	1	LF351N	U2
				0313-0120	1	LF353N	U1
				0313-0048	1	Mixer SBL-1	MX1
				0313-0060	1	MC10102	U3
						TRANSISTORS:	
				0481-0015	1	3N128	Q6
				0481-0028	1	2N4275	Q7
				0481-0029	2	3N209	Q2, 4
				0481-0030	3	A430	Q1, 3, 5
						DIODES:	
				0482-0004	3	IN4148	CR3, 7, 8
				0482-0034	5	KV 2201A	CR1, 2, 4-6
						INDUCTORS:	
				0180-0034	2	180uH	L15, 16
				0180-0036	2	39uH	L9, 10
				0180-0038	2	0.56uH	L1, 8
				0180-0040	1	1000uH	L14
				0180-0044	2	2.2uH	L3, 6
				A112454-02	1	Coil	L13
				A1126 -02	1	Coil	L11
				A112686-01	2	Inductor 5T #28	L4, 5
				A112686-02	2	Inductor 5T #28	L2, 7
				A112852-00	1	IT Coil	L12
						MISCELLANEOUS:	
				0210-0320	22	Swage Terminal	E2-8, 10, 12, 14, 15-20, TP1-6
Module: D112929-00 - PCB Assembly, IF Down Converter - REV B							
PART NUMBER	QTY.	DESCRIPTION	DESIGNATION				
		RESISTORS:					
		1/4W, 5%					
0472-0017	3	47 ohm	R34, 58, 62				
0472-0022	2	75 ohm	R25, 61				
0472-0025	4	100 ohm	R14, 18, 24, 59				
0472-0037	1	330 ohm	R15	0180-0034	2	180uH	L15, 16
0472-0041	1	470	R5	0180-0036	2	39uH	L9, 10
0472-0042	2	510 ohm	R52, 53	0180-0038	2	0.56uH	L1, 8
0472-0043	7	560 ohm	R2, 3, 30-33, 57	0180-0040	1	1000uH	L14
0472-0049	11	1000 ohm	R4, 27-29, 49-51, 56, 60, 61, 10	0180-0044	2	2.2uH	L3, 6
0472-0053	1	1500 ohm	R16	A112454-02	1	Coil	L13
0472-0056	1	2000 ohm	R26	A1126 -02	1	Coil	L11
0472-0073	5	10k	R7, 8, 19, 47, 48	A112686-01	2	Inductor 5T #28	L4, 5
0472-0077	1	15k	R45	A112686-02	2	Inductor 5T #28	L2, 7
0472-0081	2	22k	R38, 44	A112852-00	1	IT Coil	L12
0472-0082	1	24k	R39			MISCELLANEOUS:	
				0210-0320	22	Swage Terminal	E2-8, 10, 12, 14, 15-20, TP1-6

Module Parts List Continued in Next Column ➡

Module Parts List Continued on Next Page ➡

COASTCOM MODEL 412 DEMODULATOR REPLACEABLE PARTS LIST

PART NUMBER	QTY.	DESCRIPTION	DESIGNATION	PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
0210-0342	1	Shorting plug	W1	0313-0083	1	LM337K	U3
0210-0343	4	Connector Jack	E21-24	0313-0113	1	LM350K	U1
0210-0349	4	Swage Terminal	E1, 9, 11, 13			DIODES:	
0270-0001	1	10.7 MHz BPF	FL6	0482-0036	6	MR751	CR1-6
				0482-0037	6	IN4001	CR7-12
C112931-00	1	PCB Down Conv.		0482-0103	1	LED	
						HP5082-4555	DS1
B112961-01	2	Cable Assy				MISCELLANEOUS:	
B112961-02	1	Cable Assy		0210-0320	17	Swage Terminal	E1-15, 18, 19
B112965-01	1	Cable Assy		0210-0372	3	Brkt Cap Mtg	
		REFERENCE DWG:		0280-0077	3	Heatsink	U1-3
D112810-00	R	Schematic		0510-0008	1	Fuse, 1A	
C112928-00	R	Component Layout				SLO - BLO	F1
0600-0011A		Wire #22 AWG					
		Blk		0510-0016	2	Fuse Holder	
0600-0011B		Wire #22 AWG		D112829-00	1	PCB	
		Red			12	6-32 x 3/8	
0600-0011M		Wire #22 AWG			6	PHIL PHMS	
		Wht/Orange			6	6-32 x 5/8	
0600-0011N		Wire #22 AWG			17	PHIL PHMS	
		Wht/Yellow			17	6-32 Keps nut	
0600-0011S		Wire #22 AWG			17	#6 Flt Wshr	
		Blu			6	#10 ITLW	
		FACTORY SELECT COMPONENTS:			12	#10 Flt R.P. Wshr	
	1		C12		6	#10-32 x 3/8 RHMS	
	1		C27		1	#6-32 Keps nut SP	
Module: D112887-00 - PCB Assembly, Power Supply - REV A							
				0600-0014F	1 1/4"	#6 FW, SP	
						Wire, #22 AWG	
						Solid, GRN	W2
				0600-0011D	10"	Wire, #22 AWG	
						Gray	
				D112946-00		REFERENCE DRWS:	
				C113015-00		Component Layout	
						Schematic	
Module: B112888-00 - PCB Assembly, Display Board - REV A							
PART NUMBER	QTY.	DESCRIPTION	DESIGNATION	PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
		RESISTORS:				RESISTORS:	
		1/8W, 1% MF				1/4W, 5%	
0470-0014	1	249 ohm	R17	0472-0029	9	150 ohm	R4-12
0470-0059	2	1000 ohm	R7, 8	0472-0057	1	2200 ohm	R1
0470-0072	1	665 ohm	R15	0472-0033	2	220 ohm	R2, 3
0470-0101	2	100 ohm	R10, 11			SEMI-CONDUCTORS:	
0471-0026		620 ohm 1/2W, 5%	R1			INTEGRATED	
						CIRCUITS:	
0472-0049	4	1000 ohm		0313-0055	1	MC14001B	U1
		1/4W, 5%	R12-14, 18	0313-0065	1	MC14511	U3
0475-0042	3	POT 200 ohm S.T.	R6, 9, 16	0313-0066	1	MC14008	U2
0152-0025	1	CAPACITORS:					
		10uF 35V	C7				
0152-0026	6	22uF 20V	C2, 3, 8, 9 11, 12				
0152-0030	1	18,000uF, 15V	C1				
0152-0031	2	6,000uF 35V	C4, 5				
		SEMI-CONDUCTORS:					
		INTEGRATED					
		CIRCUITS:					
0313-0082	1	LM317K	U2				

Module Parts List Continued in Next Column

Module Parts List Continued on Next Page

COASTCOM MODEL 412 DEMODULATOR REPLACEABLE PARTS LIST							
				Module: C112940-00 - IF Down Converter Cable Assembly - REV A			
PART NUMBER	QTY.	DESCRIPTION	DESIGNATION	PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
0481-0011	1	TRANSISTORS: 2N3906	Q1	0210-0310	1	Plug Assembly	
0240-0013	1	DIODES: 2664E	DS3	0210-0376	1	Connector Receptacle	
0482-0103	2	HP5082-4555	DS1, 2	0210-0378	4	Fem. Terminal	
C112830-00		MISCELLANEOUS: PCB 40023		0210-0377	1	Male Terminal	
B112812-00	R	REFERENCE DRW's: Schematic		0280-0003	9	Cable Tie	
B112945-00	R	Component Layout		Module: D112938-00 - Unit Assembly - REV A			
Module: D112943-00 - Power Supply Assembly - REV A				PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
C112863-01	1	Front Panel		C112982-00	1	Front Panel Assy	
D112887-00	1	Pwr Supply PCB Assy		D112939-00	1	Stiffener Plate Assy	
C112877-02	1	Stiffener Plate		B112888-00	1	Display Board Assy	
C112878-00	2	Gusset Stiffener		D112811-00	1	PCB Assy	
C112981-00	1	XFormer Mtg Plate		0280-0081	4	Stand Off	
0560-0028	1	XFormer, Sm	T1		8	#6-32 x 1/4 PHMS	
0560-0029	1	XFormer, Lg	T2		8	#6 Spring Wshr	
0140-0011	2	Handle			4	#6-32 x 7/16 FHMS	
0210-0374B	4	Test Jack, Red			4	#6 FW	
0210-0374C	1	Test Jack, Blk			4	#6-32 Keps nut	
C113074-00	1	Wire Harness		0600-0011a	11"	Black	
	2	#6-32 Keps nut, SP		0600-0011c	.5"	Brown	
	6	#6-32 Keps nut		0600-0011b	5"	Red	
	8	#6 x 5/8" Spacer		0600-0011f	5"	Yellow	
	2	#6 Flt Wshr SP		0600-0011d	20"	Gray	
	8	#6 Flt Wshr			1	I.D. Label	
	10	#6 Spring Wshr		D113011-00		REFERENCE DRAWINGS: Interconnect Diagram	
0280-0002	2	Tie Mount		Module: D112933-00 - Down Converter Can Assembly - REV B			
0280-0003	2	Cable Tie		PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
	8	#6-32 x 3/8" Lg PHMS		D112929-00	1	PCB Assy	
	2	#6-32 x 1/2" Lg PHMS		D112856-00	1	IF Converter Can	
	2	#6-32 x 3/8" Lg FHMS		C112940-00	1	IF Converter Cable	
	6	#6-32 x 1" Lg PHMS			8	PHMS 4-40 x 3/16	
	2	#6-32 x 1-1/8" Lg FHMS			8	Wshr Flt #4 RP	
	4	#8 FW/RP			9	Wshr, Split Lock #4	
	4	#8 ETLW		0270-0002	5	Feet-thru filters	FL1-5
	4	#8-32 x 3/8" Lg PHMS			1	#4-40 x 1/4 PHMS	
	A/R	Glyptol			1	#4 FW-SP	
	1	ID Label		0280-0062	2	Cable Tie Wrap	
					1	Cable Tie Mount	

Module Parts List Continued in Next Column

Module Parts List Continued on Next Page

COASTCOM MODEL 412 DEMODULATOR REPLACEABLE PARTS LIST

Module: D112939-00 - Stiffener Plate Assembly - REV B				PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
PART NUMBER	QTY.	DESCRIPTION	DESIGNATION				
				0210-0380	1	Connector Blue Ribbon	
C112877-01	1	Stiffener Plate		0210-0351	5	Connector Card Edge	
D112933-00	1	IF Down Conv. Can Ass'y		0290-0003	1	Splitter 4 Way	
B112941-00	1	Expander		D112924-00	1	PC Board	
	8	6-32 Keps nut		0210-0381	1	Bail Mtg Kit (2 per)	
	8	6-32 x 3/8 FHMS		B112411-01	2	Cable Assy	
	8	6 FW		B112411-02	1	Cable Assy	
	4	4-40 x 3/8 PHMS		B112411-04	1	Cable Assy	
	4	4 ETLW			2	Screw, PHMS, 4-40 x 3/4	
	4	FW			10	Screw, PHMS, 6-32 x 3/4	
	1	Tie Wrap			4	Washer #4 Flat	
Module: D112942-00 - Shelf Assembly - REV A						10	Washer #6 Flat
PART NUMBER	QTY.	DESCRIPTION	DESIGNATION			4	Keps Nut #4-40
D112711-00	1	Card Cage Ass'y				10	Keps Nut #6-32
C112712-00	2	Mtg Bracket		0280-0002	4	Cable Tie Mount	
0280-0084	20	Card Guide		0280-0003	4	Cable Tie	
D112925-00	1	Back Plane Assy			2	Dbl Stick Foam Tape, 1-1/8 x 3/8 x 1/16	
	8	#6-32 Keps nut			2	Warning Label	
	16	#Flat Washer		Module: C112982-00 - Front Panel Assembly - REV C			
	8	#6-32 x 1/2 PHMS		PART NUMBER	QTY.	DESCRIPTION	DESIGNATION
	12	#6-32 x 3/16 FHMS		C112855-00	1	Front Panel	
0280-0063	1	Strain Relief		B112987-00	1	View Plate	
0280-0085	2	10 1/4" Continuous Grommet		0140-0011	2	Handle	
B113010-00	1	Power Cable Assy		0510-0118	1	Switch Thumb Wheel	
	A/R	Glyptol		0510-0101	1	Switch Toggle	
	1	I.D. Label		0510-0125	1	Switch Push-button	
C113012-00		REFERENCE DRAWINGS: Schematic		0210-0207	2	Jack Phone	
Module: D112925-00 - PCB Assembly, Backplane - REV A						4	#8-32 x 3/8 PHMS
PART NUMBER	QTY.	DESCRIPTION	DESIGNATION			4	#8 FW
0210-0037	4	Connector BNC				4	#8 ITLW
0210-0323	2	Barrier Block Cover - 3 POS				2	#4-40 Hex Nut
0210-0326	1	Terminal Block - 3 POS				2	#4 FW
0210-0352	4	Barrier Strip - 4 POS				2	#4-40 x 3/8 PHMS Adhesive
						2	#4 ITLW

Module Parts List Continued in Next Column



- 1971 - COASTCOM was first to develop an FM subcarrier receiver equipped with a tracking filter (patented) to retrieve high quality audio program signals from video interference or very noisy environments.
- 1974 - COASTCOM was one of the first to develop a successful single channel per carrier (SCPC) program channel for use in satellite communications. The COASTCOM model 411 was the forerunner of the 412 SCPC described in this manual.
- 1978 - Introduction of a VF Compondor that quiets voice circuits and can double transponder or radio link channel capacity.
- 1978 - Introduction of a low-cost alarm and control system-ALARMNET- for dedicated line, microwave or satellite systems.
- 1979 - Introduction of a 360 channel SCPC terminal- model 412-360 - for use over the entire 52 - 88 MHz IF range.
- 1979 - Introduction of a 15 kHz digital program channel to interface with the T1 hierarchy.

COASTCOM - ELECTRONICS SPECIALISTS IN SATELLITE AND TERRESTRIAL COMMUNICATIONS. FOR MORE INFORMATION ABOUT COASTCOM PRODUCTS, CONTACT:

COASTCOM

2312 Stanwell Drive
Concord, California
94520

Telephone: 415-825-7500
Twx: 910-481-5781



2312 Stanwell Drive
Concord, California 94520
(415) 825-7500
TWX 910-481-5781

shelf - 440

112942-00

P/S

550

113048-00

Re mod 12 - 1740

Judi Pendleton

360 - 1715