

SIGMA TEK, INC.
1U661-001 COMM / NAV / DME / ADF
RADIO CONTROL PANEL

INSTALLATION MANUAL

LIST OF EFFECTIVE PAGES

Original Release..... AJanuary 13, 2004
First Revision BMarch 25, 2004
Second Revision CJune 25, 2004

Subject	Page No.	Revision
Table of Contents	1	C
General Information	2	C
Installation	3	C
"	4	C
Wiring Diagram	5	C
Leading Particulars	6	C
Outline Configuration	7	C
Pin List	8	C
"	9	C

CHANGE DESCRIPTION

Revision	Change
A	Original Release
B	Correct pin description of connector J4
C	Update Installation Wiring Diagram, Figure 1

TABLE OF CONTENTS

Section	Title	Page No.
1.0	General Information	2
1.1	Introduction	2
1.2	Description Of Equipment	2
2.0	Installation.....	3
2.1	Introduction.....	3
2.3	Unpacking	3
2.4	Inspection	3
2.4	Installation Requirements	3
2.5	Installation Procedure	3
2.6	Post Installation Check	3
3.0	Technical Specifications	6
4.0	Connector Pin List	8

LIST OF FIGURES

	Title	Page No.
Figure 1	Installation Wiring Diagram	5
Figure 2	Outline Configuration	7

1.0 GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains operation and installation information for the 1U661-001 COMM / NAV / DME / ADF Control Panel manufactured by Sigma Tek, Inc., 1001 Industrial Road, Augusta, Kansas 67010. The 1U661-001 Control Panel is designed specifically to replace older mechanical Control Panels installed in various 500 series Citation Jets manufactured by Cessna Aircraft Company.

1.2 DESCRIPTION OF EQUIPMENT

The 1U661-001 Control Panel is designed to provide remote tuning of two VHF COMM Transceivers, two VHF NAV / DME Receivers and one Automatic Direction Finding (ADF) Receiver. The Control Panel is capable of tuning within a VHF COMM frequency range of 118.00(0) to 136.990 MHz in 25 KHz or 8.33 KHz increments (switch selectable). An optional extended tuning range from 137.00(0) to 151.97(5) MHz in 25 KHz increments is available. The VHF NAV frequency range is 108.00 to 117.95 MHz in 50 KHz increments. The ADF frequency range is 190.0 to 1799.5 KHz in 0.5 KHz steps. The capability of pre-selecting frequencies provide a single level of memory. Up to Ten (10) additional memory channels can be stored and retrieved with the "MEM" buttons on the Control Panel. Audio Volume controls with integrated power Off switch are available for both COMM and NAV radios. Other ancillary functions incorporated on the Control Panel are; Squelch On/Off, Comm Test, Marker Sensitivity Hi/Lo, Nav Test, BFO On/Off and ANT/ADF mode selector.

The Control Panel has five (5) dual line, five and a half (5½) digit, Liquid Crystal Display modules. The displays offer a high degree of readability in bright sunlight, and are backlit for low ambient light viewing. The top line of each display is referred to as the "Active" display (or frequency), while the bottom line is referred to as the "Pre-Select" display. Frequency updating is performed by tuning the knobs associated with the display above it. All updates target the bottom display line. The Pre-selected frequency is activated by pressing the Transfer (TFR) switch on the tuning knob stack.

The 1U661-001 has an integrally lighted plastic panel which includes all pertinent nomenclature required to identify the function of each control. Dimming is controlled by the aircraft 5 volt DC dimming buss accessed through the rear connector. The nomenclature is clearly visible in both low and high ambient light conditions.

Internal circuitry of the Control Panel is comprised of five (5) independent Modules, one for each radio. Each Module is similar in construction, containing three (3) electronic printed circuit board (PCB) assemblies and a back plane circuit board. One electronic PCB assembly, which is duplicated in all five Modules, is the micro controller (MCU) board. This board controls the overall operation of the radio and functions associated with the Module. A second duplicated PCB assembly is the power supply (PWR) board which provides all necessary voltages for the Module electronics. The NAV and ADF Modules contain a third PCB assembly which serves as the interface board to the NAV and ATC radios. A third PCB assembly within the COMM Modules provides an interface with the COMM radios using the Commercial Standard Digital Bus (CSDB).

2.0 INSTALLATION

2.1 INTRODUCTION

Although the 1U661-001 Control Panel is designed to meet the highest levels of quality and performance, it can only attain those standards when properly installed. This section provides the user with practical guidelines to assist in the planning and installation of the 1U661-001 in the flight deck.

2.3 UNPACKING

Use care when unpacking the Control Panel from the shipping carton to prevent damage to the contents. It is also good practice to save the carton and interior packing material until the unit has been satisfactorily installed in the aircraft. The original packing material should be used in the unlikely event that it is necessary to return the unit to the factory.

2.4 INSPECTION

A visual inspection of the Control Panel should be performed to insure that physical damage has not occurred during shipment. Look over the front of the panel for any chips or scratches. This includes the displays and all controls. All of the controls should be rotated, pushed or toggled to ensure proper mechanical operation. The metal cover should not show any dents, and should be secure. The rear connectors should not show any signs of being damaged along the circumference. The pins should be visually inspected to insure they are not damaged or bent.

2.4 INSTALLATION REQUIREMENTS

This Control Panel is intended for use in a cockpit environment. The control panel is mounted to the instrument panel with seven (7) screws. To ensure proper grounding of unit, all bare metal mounting surfaces must be clean and free of any contaminants, debris or corrosion.

2.5 INSTALLATION PROCEDURE

Connect the five (5) circular connectors to the appropriate mating connectors on the back of the Control Panel. J1 and J2 should be connected to the COMM transceivers, J3 and J5 should be connected to the NAV / DME receivers, and J4 should be connected to the ADF Receiver. The COMM1 connector J1 and the ADF connector J4 are identical, so care should be taken to insure the proper cable is attached to the correct connector.

After the connectors have been checked for successful mating, place the Control Panel in the opening provided for it. Using the seven (7) screws, securely fasten the unit.

Note: Connector J6 on the 1U661-001 Control Panel is not used in this installation. This connector has a metal cover installed, which should not be removed.

2.6 POST INSTALLATION CHECK

Apply power to the 1U661-001 Control Panel and the radios. The displays should show the last frequencies selected when the Control Panel was last powered down. The Comm displays should show frequencies within the range of 118.00 to 136.97 (or 151.975) MHz. The Nav display should show frequencies of 108.00 to 117.95 MHz. The ADF display frequencies between 190.0 and 1799.5 KHz.

1U661-001 COMM / NAV / DME / ADF CONTROL PANEL

To check the Control Panel and associated systems, any of the five (5) TEST switches may be activated. This should cause the activation of all pertinent display segments on the Control Panel. In addition to activating all display segments, the TEST function should also illuminate the corresponding indicator.

Turn all knobs, and ensure that the appropriate display line is being updated properly. Select frequencies known to contain information. Verify that the outer (or small) knob operates the fractional portion of the display while the large, inner knob updates the whole values. A clockwise rotation of the knobs should cause the frequency to increment, while a counter clockwise rotation should result in the frequency being decremented.

After selecting the desired frequencies, press the TFR switch to swap the values from Pre Select to Active. The associated radio should tune to the frequency shown in the Active display.

A small knob adjusts the volume level of the audio signal. Clockwise rotation of the volume knob should increase volume level. The unit is turned off with a full counter-clockwise rotation (COMM and NAV only).

1U661-001 COMM / NAV / DME / ADF CONTROL PANEL

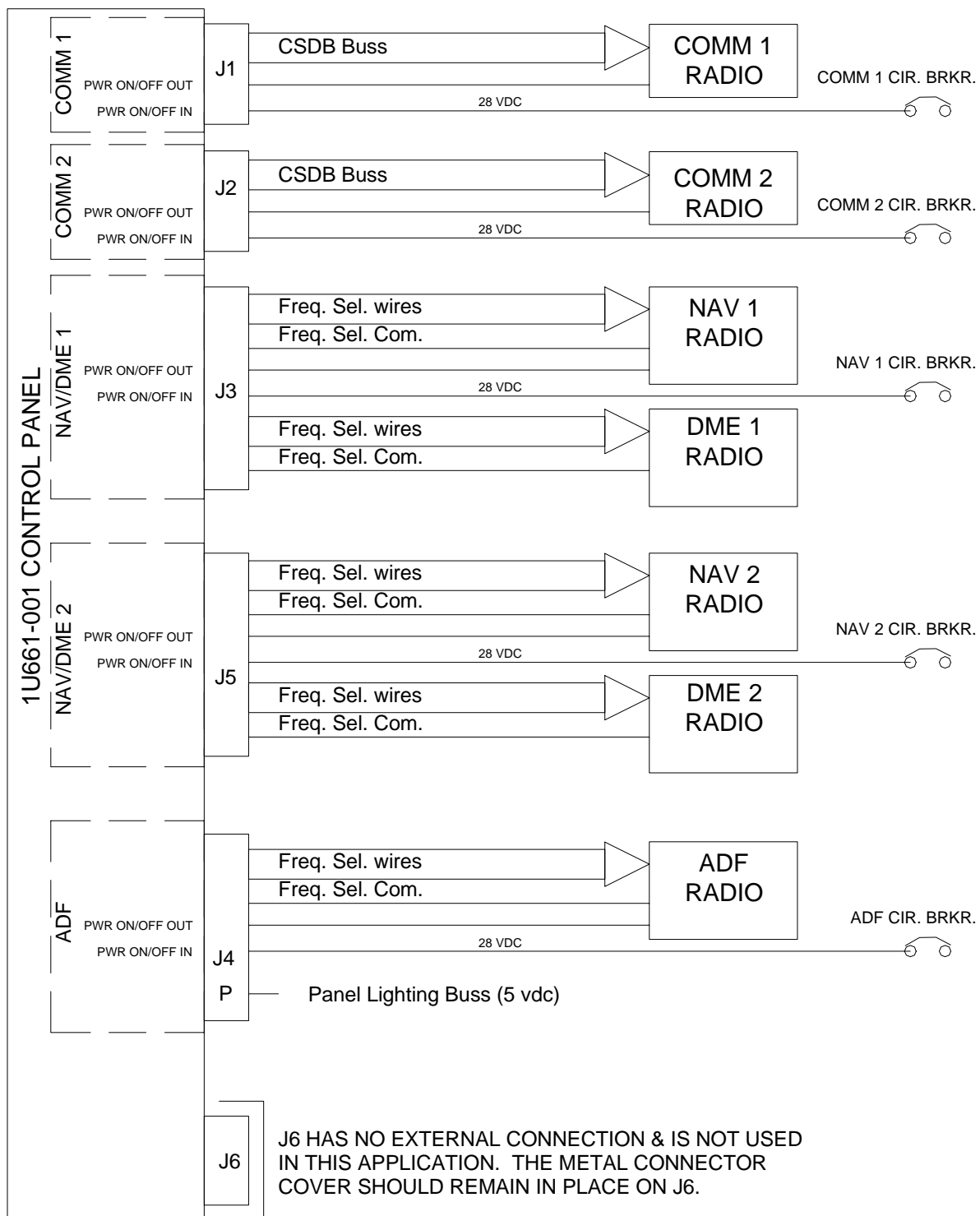


Figure 1
Installation Block Diagram
(Refer to Pin Table for specific pins)

3.0 TECHNICAL SPECIFICATIONS

PHYSICAL CHARACTERISTICS

Dimensions: 7.65" W x 6.90" H x 6.00" D

Weight: 8.0 pounds maximum

Displays: 5½ digit dual line Liquid Crystal Display, White digits on black background

Panel Color: Gray, FED-STD-595 color # 36118

Knob Color: Black

Nomenclature: White, back lighted

Lighting: Panel & Display - Aviation Blue-White
COMM Transmit (XMT) - Green

Panel Connectors: J1 (COMM 1) - MS 3122A20-41P (or equivalent)
J2 (COMM 2) - MS 3122A20-41PW (or equivalent)
J3 (NAV 1) - MS 3122A22-55P (or equivalent)
J4 (ADF) - MS 3122A20-41P (or equivalent)
J5 (NAV 2) - MS 3122A22-55PW (or equivalent)
J6 No Connection

POWER REQUIREMENTS

Primary Power: 28 volts DC, @ 100 mA nominal per Module (500 mA total).

Lights: (Panel) 5 volts DC, @ 3.0 A maximum
(Display & Indicators) part of internal supply from Primary Power

PRIMARY FUNCTIONS

VHF COMM Control (1 & 2):

Freq. Range 118.00(0) to 136.97(5) MHz, in 25 KHz increments - default,
(switch selectable) 118.0000 to 136.9916 MHz in 8.33 KHz increments
(118.005 to 136.990 MHz) = Display in 8.33 KHz increments

*Extended Range adds 137.00(0) to 151.97(5) MHz, in 25 KHz increments

Interface Commercial Standard Digital Bus (CSDB)

Compatible Equip. Collins VHF-21C, VHF-21D, VHF-22C and VHF-22D*

VHF NAV / DME Control (1 & 2):

Freq. Range 108.00(0) to 117.95(0) MHz, in 50 KHz increments
(plus 40 ILS channels)

Interface Arinc 547 NAV receiver (Arinc 410 tuning)

Compatible Equip. Collins VIR-30, VIR-32, VIR-42 and Collins DME-40

ADF Control:

Freq. Range 190.0 to 1750.0 KHz, in 0.5 KHz increments

Interface Arinc 570 ADF Receiver (BCD tuning)

Compatible Equip. Collins ADF 60

1U661-001 COMM / NAV / DME / ADF CONTROL PANEL

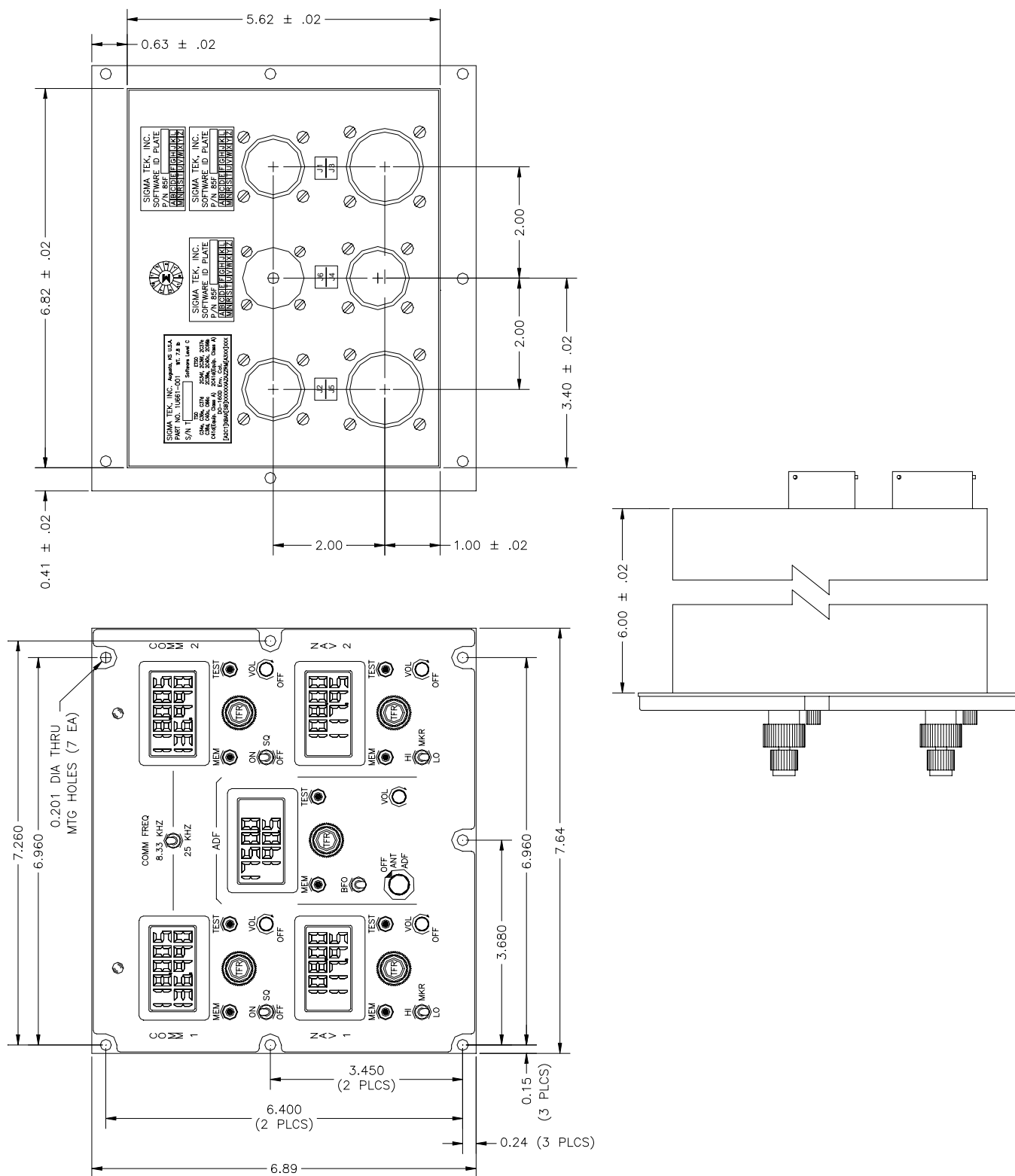


Figure 2
Outline Configuration

1U661-001 COMM / NAV / DME / ADF CONTROL PANEL

4.0 CONNECTOR PIN LIST

J1 (Comm 1) MS3122A20-41P & J2 (Comm 2) MS3122A20-41PW Panel Connector

<u>Pin</u>	<u>Description</u>	<u>Pin</u>	<u>Description</u>
A-P	spare	Z	Audio In Hi
R	“B” Serial Data In	a	Audio Out Arm
S	“A” Serial Data In	b	Audio Common Lo
T, U	spare	c	Power On/Off In, 28 vdc
V	“A” Serial Data Out	d	Power On/Off Out, 28 vdc (internal pwr)
W	“B” Serial Data Out	e-s	spare
X	Serial Data Shield	t	Chassis Gnd (Internal pwr return)
Y	reserved (Freq. Select Common)		

J3 (Nav / Dme 1) MS3122A22-55P & J5 (Nav / Dme 2) MS3122A22-55PW Panel Connector

<u>Pin</u>	<u>Description</u>	<u>Pin</u>	<u>Description</u>
A	NAV 10 MHz WireA	a	Power On/Off Out, 28 vdc (internal pwr)
B	NAV 10 MHz WireE	b-f	spare
C	NAV 1 MHz WireA	g	NAV Test return ground
D	NAV 1 MHz WireB	h	spare
E	NAV 1 MHz WireC	i	Chassis Gnd (Internal pwr return)
F	NAV 1 MHz WireD	j	DME 10 MHz WireA
G	NAV 1 MHz WireE	k	DME 10 MHz WireE
H	NAV 100 KHz Wire A	m	DME 1 MHz Wire A
J	NAV 100 KHz Wire B	n	DME 1 MHz Wire B
K	NAV 100 KHz Wire C	p	DME 1 MHz Wire C
L	NAV 100 KHz Wire D	q	DME 1 MHz Wire D
M	NAV 100 KHz Wire E	r	DME 1 MHz Wire E
N	NAV 10 KHz Wire B	s	DME 100 KHz Wire A
P	NAV 10 KHz Wire C	t	DME 100 KHz Wire B
R	NAV Frequency Select Common	u	DME 100 KHz Wire C
S	ILS Energize	v	DME 100 KHz Wire D
T	Marker Beacon Sensitivity Hi	w	DME 100 KHz Wire E
U	Marker Beacon Sensitivity Common	x	DME 10 KHz Wire C
V	NAV Test	y	spare
W	NAV Audio In Hi	z	DME Frequency Select Common
X	NAV Audio Out Arm	AA	spare
Y	NAV Audio Out Common	thru	
Z	Power On/Off In, 28 vdc	HH	spare

1U661-001 COMM / NAV / DME / ADF CONTROL PANEL

J4 (ADF) MS3122A20-41P

Panel Connector

<u>Pin</u>	<u>Description</u>	<u>Pin</u>	<u>Description</u>
A	Test	X	1 KHz A wire
B	Reserved	Y	1 KHz B wire
C	ADF/ANT mode	Z	1 KHz C wire
D-E	Spare	a-e	spare
F	BFO	f	100 KHz B wire
G	Reserved	g	100 KHz C wire
H	26 VAC Power In	h	100 KHz D wire
J	26 VAC Power Out	i	0.5 KHz A wire
K	27.5 VDC Power In	j	Frequency Common
L	27.5 VDC Power Out	k	0.5 KHz A wire
M	Chassis Ground	m	1 KHz D wire
N	Spare	n	10 KHz A wire
P	5 VDC Panel Lights	p	10 KHz B wire
R-S	Spare	q	10 KHz C wire
T	Receiver Audio Hi (in)	r	10 KHz D wire
U	Receiver Audio Lo	s	100 KHz A wire
V	Controlled Audio Lo	t	1 MHz A wire
W	Controlled Audio Hi (out)		

J6 (No Connections) This connector is not used in this installation