APPENDIX B - MOUNT SPECIFIC DATA
For
VERTEX 2.4m. SM-LT

This appendix describes RC3000 operations unique for the Vertex 2.4m. SM-LT mount.

Revision History. Date: 29 October 2004 - Software Version: 1.45

1.1 Manual Organization

This appendix is provided as a supplement to the baseline RC3000 manual. Differences between this version and the operation described in the baseline RC3000 manual are noted on a paragraph by paragraph basis.

1.2 RC3000 Features

All features described in the baseline manual are supported.

Hardware Configuration. A RC3000E version of hardware is required for this mount. The E model is similar to a RC3000A (low voltage drive) model but the chassis backpanel contains the correct connectors to mate with standard Vertex/RSI MVO-style cables.

Software Configuration. Two software versions support this mount.

Software version VE will support the 2.4 SM-LT mount for all RC3000 units.

Software version VF is similar to VE plus it supports an additional feature that will monitor elevation current during the stow process. Version VF is only available for use on RC3000 units containing the newer “A2” style hardware. NOTE: RC3000s with “A2” style hardware will have serial numbers starting with -2000.

Software will be designated as RC3K-VE-xxx or RC3K-VF-xxx. Both versions are described in this appendix. Unique items only applicable to VF software will be noted.

1.3.1 Controller Description

RESOLVER BOARD. To support the VE/VF versions, the optional resolver to digital conversion board must be added to the baseline RC3000 hardware.

1.3.2 System Interface Requirements

The following unique interface requirements exist for the VE/VF versions:

- The MVO’s CCW polarization limit switch drives the RC3000’s polarization stow limit input
- Feed type is sensed via the RC3000 inputs normally used to sense pulse inputs.
- No azimuth potentiometer exist, a resolver is used for sensing azimuth position and for performing high resolution movements in azimuth. A resolver is used for high resolution movements in elevation.

1.3.3 Operational Overview

Operation of the VE/VF versions is almost identical to that described in the baseline manual. Differences will be noted in the appropriate paragraphs.

1.3.7 Drive System

Position Sensing and Limits. In addtion to azimuth cw and ccw limit switches, azimuth software limits are implemented. An elevation UP software limit is also implemented for this version.

Jam and Runaway Sensing. Jammed and runaway sensing is based on resolver counts.

2.0 INSTALLATION

2.1.1 RC3000 Antenna Controller

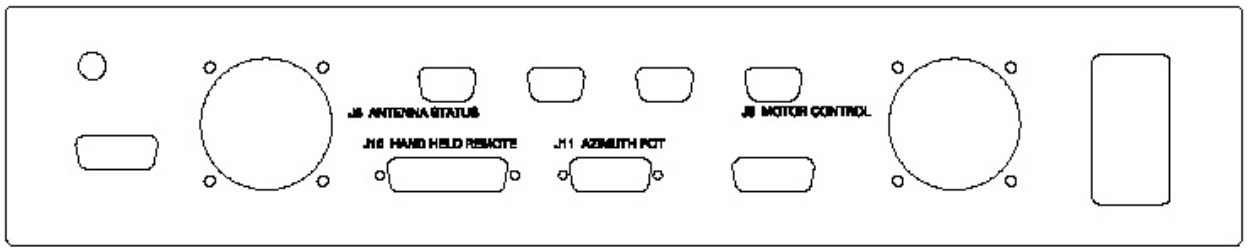
The RC3000E is slightly deeper (19.1" vs. 17.05") than the baseline RC3000. This additional depth is required to accommodate the backpanel with MVO-style connectors.

2.1.4 Electronic Clinometer

The inclinometer should be rigged with the face vertical. With the face vertical, the inclinometer should be mounted so that it is 19.0 (35.0 –16.0) degrees from vertical. This orientation will allow linear output from the inclinometer to a RF angle of 90 degrees.

2.2 Electrical Connections.

The RC3000E's backpanel contains the standard connectors for use with the RSI MVO's antenna status (J8) and motor control (J9) cabling. The following diagram shows this backpanel.



2.2.1 Power Entry

The RC3000E has the same fuse requirements as the RC3050A model (8 A. for 115, 4 A. for 230).

2.2.2 Motor Drive

2.2.3 Drive Sense

2.2.4 Limit Switches

2.2.7 Accessories

2.2.10 Pulse Sensors

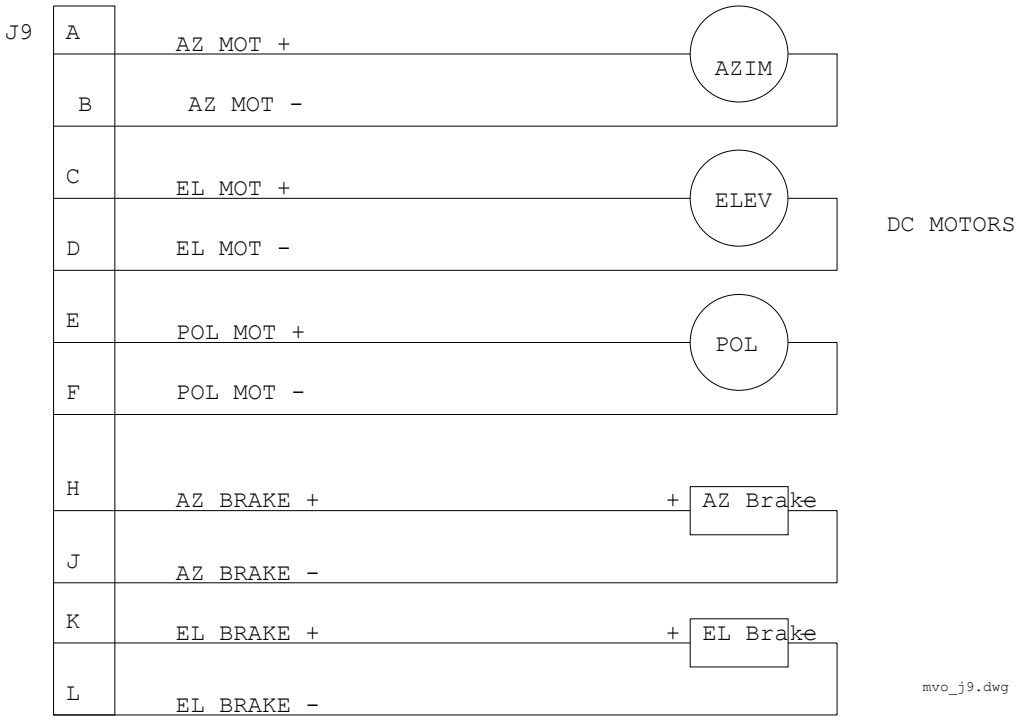
Internal to the RC3000E is cabling that adapts these standard interface connections shown in the baseline manual to the MVO style connectors on the backpanel. Schematics are provided in section 4.2 showing this adaptation.

NOTE: the RC3000's Pulse Sensor inputs are used for sensing the status of the MVO's feed type inputs. The mechanization of these inputs is shown in the adapter cable schematic.

The individual MVO style connectors are now discussed.

Motor Control.

Azimuth, elevation and polarization drive commands along with azimuth and elevation brake control is provided via J9. J9 is a female 35 pin Amphemnol MS (size 28-15) type connector.



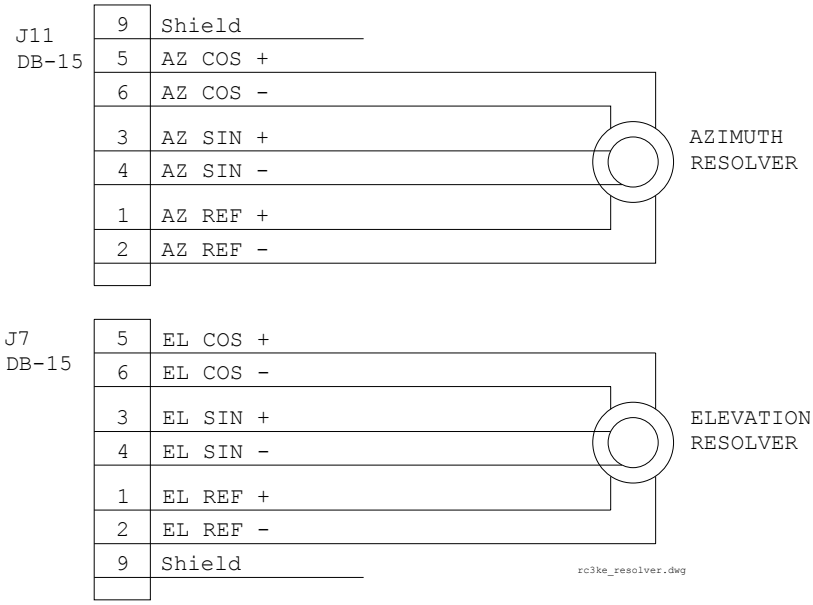
Antenna Status.

Limit switch status, feed type status, polarization and elevation position is provided via the J8 connector. J8 is a female 37 pin Amphemnol MS (size 28-21) type connector.

Pinouts for the J8 connectors are shown on the following page.

2.2.13 Resolver inputs

J11 and J7 are used for the azimuth and elevation resolver interfaces.



2.2.5 Signal Strength

NOTE: The gain and offset potentiometers associated with the signal strength connector are recessed from the backpanel on the RC3000E model. The lid of the RC3000 will have to be removed in order to calibrate these pots. This connector is designated J2 on the 3000E backpanel.

2.2.6 Navigation Sensors

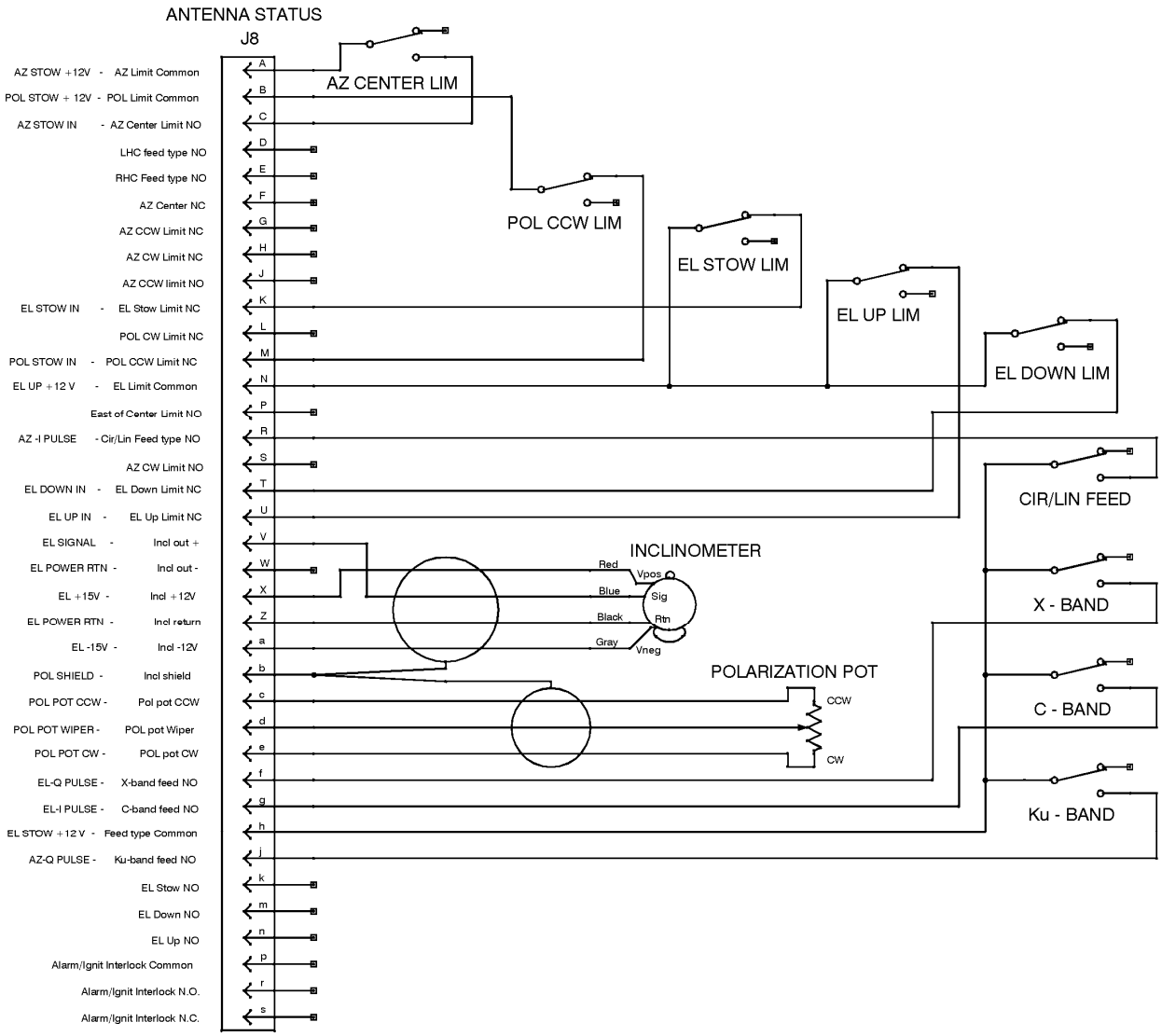
On “baseline” RC3000’s the J9 connector is a 37 pin connector. An adapter “dongle” is supplied that adapts the DB-37 to two DB-9 connectors.

The RC3000E model supplies the two DB-9 connectors (J4-GPS, J5-Fluxgate) directly on the backpanel. Pinouts for these DB-9s are as shown in the baseline manual.

2.2.8 RF Autopeak Designated as J1 for RC3000E.

2.2.11 PC Remote Control Designated as J3 for RC3000E.

These connectors are provided on the backpanel of the RC3000E. Their function is as described in the baseline manual.


ANTENNA STATUS
J8
AZ STOW +12V - AZ Limit Common
POL STOW + 12V - POL Limit Common
AZ STOW IN - AZ Center Limit NO
LHC feed type NO
RHC Feed type NO
AZ Center NC
AZ CCW Limit NC
AZ CW Limit NC
AZ CCW limit NO
EL STOW IN - EL Stow Limit NC
POL CW Limit NC
POL STOW IN - POL CCW Limit NC
EL UP +12 V - EL Limit Common
East of Center Limit NO
AZ -I PULSE - Cir/Lin Feed type NO
AZ CW Limit NO
EL DOWN IN - EL Down Limit NC
EL UP IN - EL Up Limit NC
EL SIGNAL - Incl out +
EL POWER RTN - Incl out -
EL +15V - Incl +12V
EL POWER RTN - Incl return
EL -15V - Incl -12V
POL SHIELD - Incl shield
POL POT CCW - Pol pot CCW
POL POT WIPER - POL pot Wiper
POL POT CW - POL pot CW
EL-Q PULSE - X-band feed NO
EL-I PULSE - C-band feed NO
EL STOW +12 V - Feed type Common
AZ-Q PULSE - Ku-band feed NO
EL Stow NO
EL Down NO
EL Up NO
Alarm/Ignit Interlock Common
Alarm/Ignit Interlock N.O.
Alarm/Ignit Interlock N.C.
A
B
C
D
E
F
G
H
J
K
L
M
N
P
R
S
T
U
V
W
X
Z
a
b
c
d
e
f
g
h
j
k
m
n
p
r
s
AZ CENTER LIM
POL CCW LIM
EL STOW LIM
EL UP LIM
EL DOWN LIM
CIR/LIN FEED
X - BAND
C - BAND
Ku - BAND
INCLINOMETER
Red
Blue
Black
Gray
Vpos
Sig
Rtn
Vneg
POLARIZATION POT
CCW
CW

2.3 Initial Configuration

2.3.1 Software Initialization

Reset Defaults. The table at the end of the document supplies the default configuration item values for the VE and VF versions.

NOTE: All configuration item values should be examined to determine if they are appropriate for your specific installation.

2.3.2 Elevation Calibration

Elevation calibration will be as described in the baseline manual.

Elevation Reference Position. Both the inclinometer and elevation resolver should be calibrated while the antenna's face is vertical (i.e. the elevation reference position).

With the inclinometer oriented as described in 2.1.4 the elevation reference voltage should be approximately 0.81 volts.

VF: The stow current limit (3.3.1.3.10) will need to be set to the value required to obtain the correct amount of stow "preload".

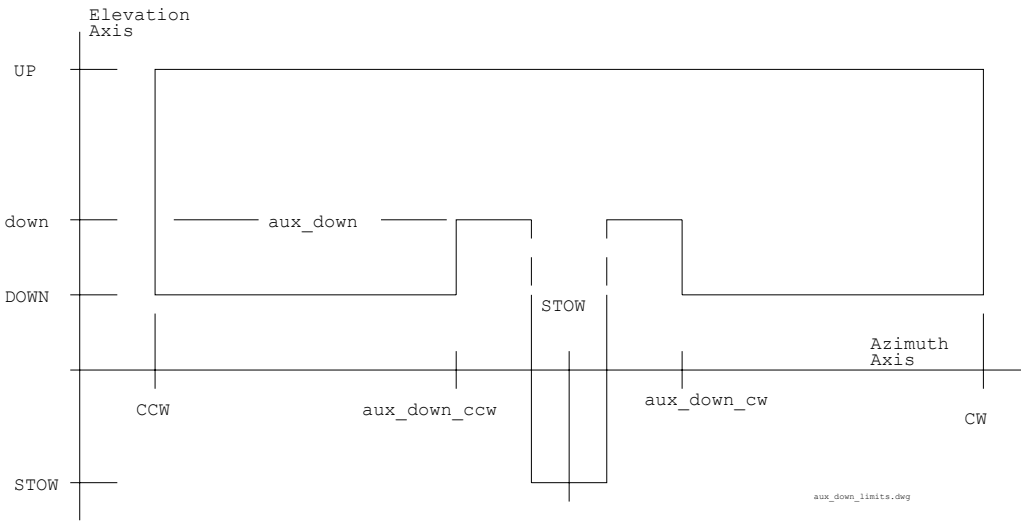
2.3.3 Azimuth Calibration.

The only position sensor on the azimuth axis is a resolver. Azimuth calibration will be as described in the baseline manual.

Azimuth Limits. In addition to using CW and CCW limit switch inputs, this version of the RC3000 implements "software" limits. The azimuth CW and CCW pulse limits (3.3.1.3.3) should be set to values that reflect the azimuth resolver count values near the end of azimuth travel. When the RC3000 senses that the azimuth axis has reached these values, it will generate a "software" limit condition even though the actual hardware limit has not been reached. If the user does not want to use the "software limit" feature, set these configuration items to values outside the range of normal azimuth travel.

Auxiliary Down Region Calibration.

The VE/VF versions implement an "auxiliary down region" that allows the mount to achieve lower elevation look angles (in some areas of travel) than is normally permitted. Compare the following drawing to the drawing in section 1.3.7 of the baseline manual. The auxiliary down region prevents the mount's feed boom from contacting the top of the vehicle when the azimuth position is near the center of travel. This auxiliary region is defined by software values as discussed in section 3.3.1.3.14.



When outside of the auxiliary region, the down limit is defined by the hardware elevation down limit switch. The auxiliary down region allows the hardware limit switch to be set lower than normal.

To define the auxiliary down region, move the antenna clockwise and counterclockwise to azimuth positions where the boom can safely move below obstructions on the top of the vehicle. Note the azimuth resolver count at these positions. These counts will define the aux_down_ccw and aux_down_cw values.

Also note the elevation resolver count that the boom needs to stay above to ensure that the top of the vehicle will not be contacted. This count will define the aux_down value.

Having recorded the aux_down_ccw, aux_down_cw and aux_down resolver counts, go to the AUX_DOWN configuration screen (3.3.1.3.14) and enter the values.

When elevation movement is restricted by the auxiliary down software values, the elevation limit field in the MANUAL mode will display “down” vs. “DOWN” which is displayed when the hardware limit is encountered.

NOTE: If one does not care to implement an auxiliary down region, set the aux_down value to a count that is below the hardware down limit position. This will effectively keep the “down” limit indication from happening.

2.3.4 Polarization Calibration.

Separate reference voltages are maintained for the three linear feed types. At power up the linear feed type is sensed and the reference voltage stored for that feed type is used. Therefore the reference voltage for each linear feed type used should be separately set.

VF: The POL CW limit is mechanized via the mount’s limit switch vs. the ACU POL CW pot.

3.2.1 Manual Mode.

If the feed type input has sensed that a circular polarized feed is installed, no POL field will be displayed since the RC3000 assumes that there is no need for polarization feedback from a circular polarized system.

The azimuth angle is generated as a function of the azimuth resolver feedback. Elevation angle represents true mount elevation based on feedback from the inclinometer. The scroll up key will switch the display between azimuth and elevation angles to resolver “counts”.

When elevation is below the DOWN limit, the displayed elevation angle will be derived from the elevation resolver.

When the auxiliary down region is active the limit display will indicate “down” vs. “DOWN”.

VF: the VF version allows for a fourth signal channel to be monitored. The Scroll/Dn key will allow the user to scroll through RF/SS1/SS2/CH4. CH4 is the channel that will be used to monitor elevation drive current. NOTE: below the DOWN limit, the display will be forced to CH4 to ensure that the appropriate signal is being monitored at the STOW limit.

VF: When the elevation stow switch is first encountered, the limit display will indicate “stow” vs. “STOW”. The display will change to “STOW” when either the stow current limit has been reached or the stow timeout value (15 seconds) has expired. NOTE: after reaching STOW, elevation must be driven above the stow limit switch to reinitialize the stow timeout.

3.2.2.2 Stow

As part of the STOW sequence the polarization axis will be driven to the polarization CCW limit when a linear feed is attached. If the polarization axis is not at the CCW limit, elevation movement below the DOWN limit will not be allowed.

VF: after sensing the elevation stow limit switch, monitoring of the elevation drive current will begin. When the elevation drive current reaches the value specified by the STW_AMP configuration item (3.3.1.3.10), the stow operation will stop. This current monitoring is intended to allow the antenna to be "loaded" firmly into the elevation stow pads.

VF: the stow operation will also cease if a timeout value is reached after the stow switch is sensed but before the current limit is sensed. This timeout condition is provided as a backup to the current sensing mechanism.

3.3.1.3.4 Azimuth Drive Monitoring

3.3.1.3.7 Elevation Drive Monitoring

The items on the Drive Monitoring screens are actually used to tune drive movements based on resolver "counts". The resolver counts are used in the same fashion as pulse counts are used for making precise movements of the mount.

3.3.1.3.10 Stow & Deploy Postions (**VF only**)

STW_AMP: ELEV STOW CURRENT LIMIT <0.0-4.9 AMPS>

For the VF version, the amount of elevation drive current used to "preload" the antenna into its stow pads may be specified.

This configuration replaces the EL_TIME item normally shown in this screen.

3.3.1.3.14 Auxiliary Down Region

The AUX DOWN configuration screen allows the values for aux_down_ccw, aux_down_cw and aux_down as discussed in section 2.3.3 to be entered.

```
 CCW:32768                CONFIG-AUX DOWN
  CW:32768
DOWN:  100
AUX CCW RESOLVER COUNT <100 - 65535>
```

3.3.2.5 Limits Maintenance

```
AZIM CW:0  CCW:1  STOW:0           LIMITS
ELEV UP:1   DN:1  STOW:1  f:1 E:1 ACTIVE
 POL CW:0  CCW:1  STOW:1  j:0 R:0
<BKSP>MAKE LIMITS INACTIVE    <MODE>EXIT
```

f:1 E:1

j:0 R:0

The state of the feed type inputs is also shown. The letters f, j, E and R correspond to corresponding pin in the connector. A 1 indicates that a switch closure is sensed at the pin. Note that E actually represents a logical OR'ing of pins E and D. The following table shows how the feed input combinations are interpretted.

Pin f	Pin j	Pin E	Pin R	Sensed Feed Type
0	0	0	1	C-Band Linear
0	0	1	0	C-Band Circular
0	1	0	0	X-Band Circular
0	1	0	1	Ku-Band Linear
1	1	0	0	Ka-Band Circular
1	1	0	1	Ka-Band Linear
All other combinations				INVALID FEED TYPE

3.3.1.2 Reset Defaults

The following table supplies the default configuration item values for this mount. Space has also been provided to record installation specific changes to the configuration items. Note: recording of installation specific changes to defaults may prove valuable when trying to restore system configuration.

CONFIGURATION ITEM	**VE**	**VF**				**INSTALL VALUE**
SYSTEM DEFINITION						
Antenna_size_cm	240	240				
GPS	1	1				
COMP	2	2				
Compass Type	1	1				
MODE	2	2				
WAVE	0	0				
ELEVATION CALIBRATION						
Zero Voltage	0.81	0.81				
Elev_offset	0.0	0.0				
Up_elev_limit	90	90				
Down_elev_limit	5	5				
Elevation_Scale_Factor	50.00	50.00				
Elevation_look_configuration	1	1				
Res	-164.00	-164.00				
Rev	0	0				
AZIMUTH CALIBRATION						
Reference_voltage	N/A	N/A				
Azim_Scale_Factor	N/A	N/A				
Fluxgate_offset	0.0	0.0				
ccw_azim_limit	150	150				
Cw_azim_limit	150	150				
Res	-180.00	-180.00				
Rev	0	0				
POLARIZATION CAL						
Zero Voltage	2.50	2.50				
Polarization_Offset	0.0	0.0				
CW Polarization Limit	90.0	90.0				
CCW Polarization Limit	90.0	90.0				
Pol_Scale_Factor	40.90	40.90				
Polarization_type	2	2				
H/V_Reference	0	0				
Default Horizontal Position	-45.0	-45.0				
Default Vertical Position	45.0	45.0				
Pol_Automove_Enable	1	1				
SIGNAL PARAMETERS						
RF_Lock	0	0				
RF_Time	0.1	0.1				
Channel 1 Polarity	1	1				
Channel 1 Threshold	100	100				
Channel 1 Delay	0.1	0.1				
Channel 1 Lock Type	0	0				
Channel 2 Polarity	1	1				
Channel 2 Threshold	100	100				
Channel 2 Delay	0.1	0.1				
Channel 2 Lock Type	0	0				

CONFIGURATION ITEM	VE	VF				INSTALL VALUE
AUTOPEAK						
Autopeak Enabled	0	0				
Signal Source	1	1				
RF Band	1	1				
Spiral Search AZ Limit	5	5				
Spiral Search EL Limit	5	5				
Spiral Signal Threshold	200	200				
Scan Range Limit	4	4				
Scan Signal Threshold	200	200				
AZIMUTH POT DRIVE						
Fast/Slow Threshold	0.5	0.5				
Maximum Position Error	0.05	0.05				
Coast Threshold	0.2	0.2				
Maximum Retry Count	3	3				
AZIMUTH PULSE DRIVE						
Pulse Scale Factor	10431	10431				
CW Pulse Limit	61000	61000				
CCW Pulse Limit	5000	5000				
Fast/Slow Threshold	100	100				
Maximum Position Error	2	2				
Coast Threshold	3	3				
Maximum Retry Count	2	2				
AZIM DRIVE MONITORING						
Jam Slop	1	1				
Runaway Slop	200	200				
Fast Deadband	1000	1000				
Slow Deadband	500	500				
ELEV POT DRIVE						
Fast/Slow Threshold	1.0	1.0				
Maximum Position Error	0.2	0.2				
Coast Threshold	0.4	0.4				
Maximum Retry Count	3	3				
ELEV PULSE DRIVE						
Pulse Scale Factor	10431	10431				
UP Pulse Limit	46000	46000				
Down Pulse Limit	1000	1000				
Fast/Slow Threshold	100	100				
Maximum Position Error	1	1				
Coast Threshold	3	3				
Maximum Retry Count	2	2				
ELEV DRIVE MONITORING						
Jam Slop	1	1				
Runaway Slop	200	200				
Fast Deadband	1000	1000				
Slow Deadband	500	500				

CONFIGURATION ITEM	**VE**	**VF**				**INSTALL VALUE**
POL POT DRIVE						
Fast/Slow Threshold	2.0	2.0				
Maximum Position Error	0.5	0.5				
Coast Threshold	0.3	0.3				
Maximum Retry Count	3	3				
POL DRIVE MONITORING						
Jam Slop	1	1				
Runaway Slop	200	200				
Fast Deadband	1000	1000				
Slow Deadband	500	500				
TRACK						
Search Enable	0	0				
Max Track Error	3	3				
Search Width	4	4				
Peakup Holdoff Time	120	120				
Track Signal Source	2	2				
Signal Sample Time	2	2				
REMOTE CONTROL						
Remote Enabled	1	1				
Bus Address	50	50				
Baud Rate	6	6				
Jog	20	20				
STOW / DEPLOY						
AZ STOW	0.0	0.0				
EL STOW	-75.0	-75.0				
PL STOW	-95.0	-95.0				
AZ DEPLOY	0.0	0.0				
EL DEPLOY	16.0	16.0				
PL DEPLOY	0.0	0.0				
PL ENABLED	3	3				
EL_TIME	0	N/A				
STW_AMP	N/A	1.0				
AUXILIARY DOWN						
AUX DOWN CCW	32768	32768				
AUX DOWN CW	32768	32768				
AUX DOWN	100	100				

4.2 Schematics

- Backpanel Interconnects

W-22AWG (10") Color as required

To 8097BAN3 J3

P3 Limit Switches

Pol Stow in	1	ORG
Pol Stow +12V	2	WHT
nc	3	
Limit Switch Shields	4	
EL Dwn +12V from EL Stow in	5	
EL Dwn in	6	RED/BLK
AZ Stow in	7	RED
nc	8	
AZ Stow +12V	9	BLK
EL Up +12V	10	BLU
EL Stow +12V	11	WHT/ORG
nc	12	
EL Stow in	13	GRN
EL Up in	14	GRN/BLK
	15	

CN-747908-2

attach to PCB mounted DB-15F with 2pcs. each CN-206514-1 and CN-206942-1 post and clip kits.

To 3K50FEAT J5

P4 Pulse Sensors

AZ-I Rtn	1	
AZ-I Pulse	2	WHT/BLK
AZ-Q Rtn	3	
AZ-Q Pulse	4	WHT/GRAY
EL-Q Pulse	5	WHT/YELLOW
EL-Q Rtn	6	
EL-I Pulse	7	WHT/PURPLE
EL-I Rtn	8	
AZ Shield	9	
AZ-I Pwr	10	
AZ-Q Pwr	11	
Alarm in	12	
EL-Q Pwr	13	
EL-I Pwr	14	
EL Shield	15	

CN-747909-2

attach to PCB mounted DB-15M with 2pcs. each CN-206514-1 and CN-206942-1 post and clip kits.

To 8097BAN3 J1

P1 AZ/EL/Pol Position

AZ pot wiper	1	GRAY\BLK
AZ pot CW	2	YELLOW\BLK
Pol shield	3	WHT/GRN
Pol pot wiper	4	YELLOW
nc	5	
EL +15V	6	BLU/BLK
EL Shield	7	
EL -15V	8	GRAY
AZ pot CCW	9	WHT\BRN
AZ shield	10	PURPLE\BLK
Pol pot CCW	11	WHT/BLU
Pol pot CW	12	PURPLE
EL Sig Rtn	13	
EL Pwr Rtn	14	BROWN
EL Sig	15	ORG/BLK

CN-747908-2

attach to PCB mounted DB-15F with 2pcs. each CN-206514-1 and CN-206942-1 post and clip kits.

CN-97-3102A28
CN-9728-21S

J8
ANTENNA STATUS
when used without the resolver option.

BLK	A	AZ Limit Common
WHT	B	POL Limit Common
RED	C	AZ Center Limit NO
	D	LHC C-band feed type NO
WHT/GRAY	E	RHC C-band feed type NO
	F	AZ Center NC
	G	AZ CCW Limit NC
	H	AZ CW Limit NC
	J	AZ CCW limit NO
GRN	K	EL Stow Limit NC
	L	POL CW Limit NC
ORG	M	POL CCW Limit NC
BLU	N	EL Limit Common
	P	East of Center Limit NO
WHT/BLK	R	Ka, Ku, or C-band Lin feed type NO
	S	AZ CW Limit NO
RED/BLK	T	EL Down Limit NC
GRN/BLK	U	EL Up Limit NC
ORG/BLK	V	Incl out +
	W	Incl out -
BLU/BLK	X	Incl +12V
BROWN	Z	Incl return
GRAY	a	Incl -12V
WHT/GRN	b	Incl shield
WHT/BLU	c	Pol pot CCW
YELLOW	d	POL pot Wiper
PURPLE	e	POL pot CW
WHT/YELLOW	f	Ka-band feed NO
	g	feed type ?
WHT/ORG	h	Feed type Common
WHT/PURPLE	j	C-band feed type NO
	k	EL Stow NO
	m	EL Down NO
	n	EL Up NO
	p	Alarm/Ignit Interlock Common
	r	Alarm/Ignit Interlock N.O.
	s	Alarm/Ignit Interlock N.C.

NOTES:
Pol Stow is located at POL CCW and is valid only when using a Ku-band linear feed.

J11
AZ POT CONNECTOR
J11A
AZ POT CONNECTOR

GRAY\BLK	1	AZ pot wiper
YELLOW\BLK	2	AZ pot CW
WHT\BRN	3	AZ pot CCW
	4	
	5	
	6	
	7	
	8	
PURPLE\BLK	9	AZ shield
	10	
	11	
	12	
	13	
	14	
	15	

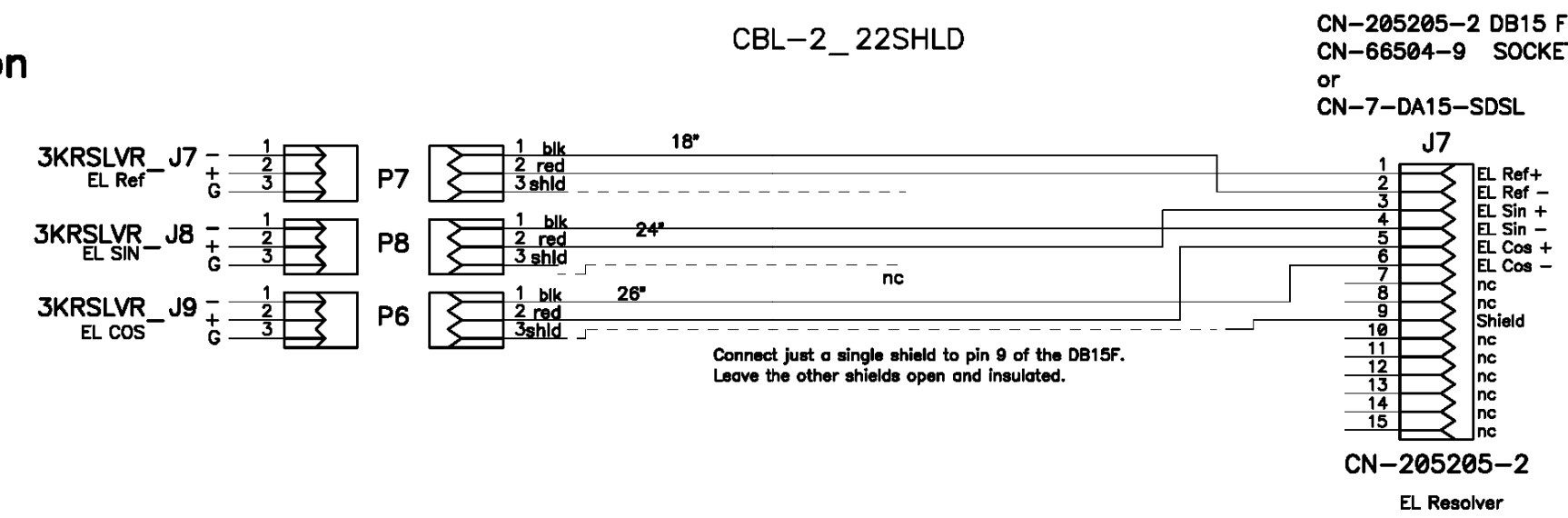
CN-7-DA15-SDSL

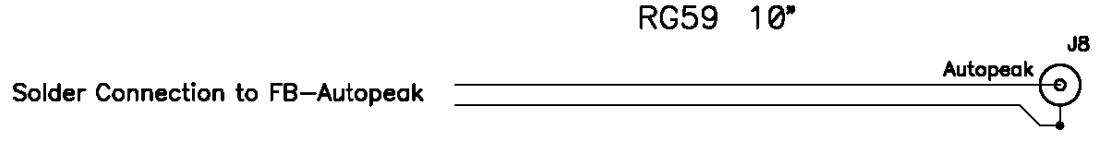
Notes:
J11 is used for the AZ potentiometer for the low-cost version and for the AZ Resolver when the RC3KRSLVR option is installed.

Revision history:
A - original
B - changed the AZ pot wiring so that VertexRSI can use the same cable for the AZ resolver and the AZ pot.
This change will commence after s/n 413, they will change the AZ pot and motor wiring but not feed type in s/n 373 to the B revision. Changed the motor polarity for AZ and EL to jive with what they have.
Added shield connection to J7 and J11B, swapped the org/grn and blu/red wires on J5 pins 4 and 5 to match the R3S software. Rerouted blu/red (J5:4) to D+E pins for new feed arrangement.
Relabled J8 pins D,E,R,f,g, and j to conform to new std.
C - added the R-100 resistors to achieve the AZ limit switch to AZ pot input conversion.
D - added back panel J6, HPA disable connections to FC-3KF-WG-DRV3. and corrected wire colors on J8 resolver - sheet 6. changed some wire colors to match production's choices.
E - Wire colors and part numbers modified 9 Aug 2002, TKB.
F - removed jumper between P3:5 and P3:11, should've never been there.

Title	RC3000E Back Panel Interconnects		
Size B	Number FB-3K50E-ASC		Rev F
Date	23 Sept. 2002	Drawn by	JFR
Filename	CN-RC3KE_BP_intrcnF.sch	Sheet 1 of	6

Connectors on 3KRSLVR2





Notes:
J7 and J11B are used only when the controller is order with the RC3KRSLVR option. Without resolvers, the controller uses J11A and J7 is blank.

See Sheet 1 for revision history

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RIBBON 8

To 3KFEAT J8

3JFEAT1_J8
Nav-Pak

Port 1: Battery Backup, 1PPS input, RX1, TX2, TX1, Gnd, Vpwr, RX2
Port 2: Gnd, Gnd, nc, Vpwr, Gnd, TX1, nc, RX1
Port 3: nc, Battery Backup, Battery Backup, nc, nc, TX2, nc, Gnd, Vpwr, RX2
Port 4: Gnd, Gnd, RX2, Vpwr, Gnd, nc, TX2, nc, nc, Battery Backup, TTL input (spare)

pins 19–40: nc

CN-89140

GPS
1 P1-Vaux
2 P1-RX1
3 P1-TX1
4 P1-Vpwr
5 P1- GND
6 P1-PPS
7 P1-TX2
8 P1-GND-Shield
9 P1-RX2
J4
CN-747052-4
CN-747275-4 SRC

to GPS Receiver FP-GPS-2

Flux Gate Compass
9 P2-GND-Shield
8
7
6 P2-GND
5 P2-Vpwr
4 P2-TX1
3 P2-RX1
2
1
J5
CN-747052-4
CN-747275-4 SRC

to Fluxgate Compass RC3KFG1

These are the connections made by an 18-conductor ribbon cable.
9 inches CBL-RBBN-4050, trim back conductors #19 – 40.
connected at J9 pin 1 of the 3KFEAT-1B, CN-89140.
Split the ribbon in two with conductors 1 – 9 installed at
back panel J4 (conductor 1 to pin 1) CN-747052-4,
and conductors 10 – 18 installed at back panel J5,
CN-747052-4 (conductor 18 to pin 1).

3KFEAT1_J10
from $\overline{TXD}$ of 3K → to $\overline{RXD}$ of PC
from RXD of 3K → toTXD of PC
from $\overline{TXD}$ of 3K → to $\overline{RXD}$ of PC
from$\overline{RXD}$ of 3K → to $\overline{TXD}$ of PC
RS-422

To 3KFEAT J10 or J11

3KFEAT_J11
TXD of 3K → to RXD (DB-9 pin2) of PC
RXD of 3K → to TXD (DB-9 pin3) of PC
Gnd of 3K → to Gnd (DB-9 pin5) of PC
RS-232

J1
pins 1–9
10 nc
CN-111810-1
RS-422 / RS-232

10-Conductor Ribbon Cable
14 inches of CBL-RBBN-1050.
Install a CN-111810-1 with CN-111564-5 SRC
with Ribbon Cond.#1 on Pin 1.
trim back conductor #10.
Install CN-747052-4 on the other end with Ribbon
Cond.#1 on pin 1.

J3
RS-422 pinout
(3) to TXD of PC
(4) to RXD of PC
(5) to $\overline{RXD}$ of PC
(9) to $\overline{TXD}$ of PC

RS-232 pinout
(2) to RXD (DB-9 pin2) of PC
(3) to TXD (DB-9 pin3) of PC
(5) to Gnd (DB-9 pin5) of PC

PCRC
CN-747052-4
CN-747275-4 SRC

to RS-422 or RS-232
Serial Port

See Sheet 1 for revision history

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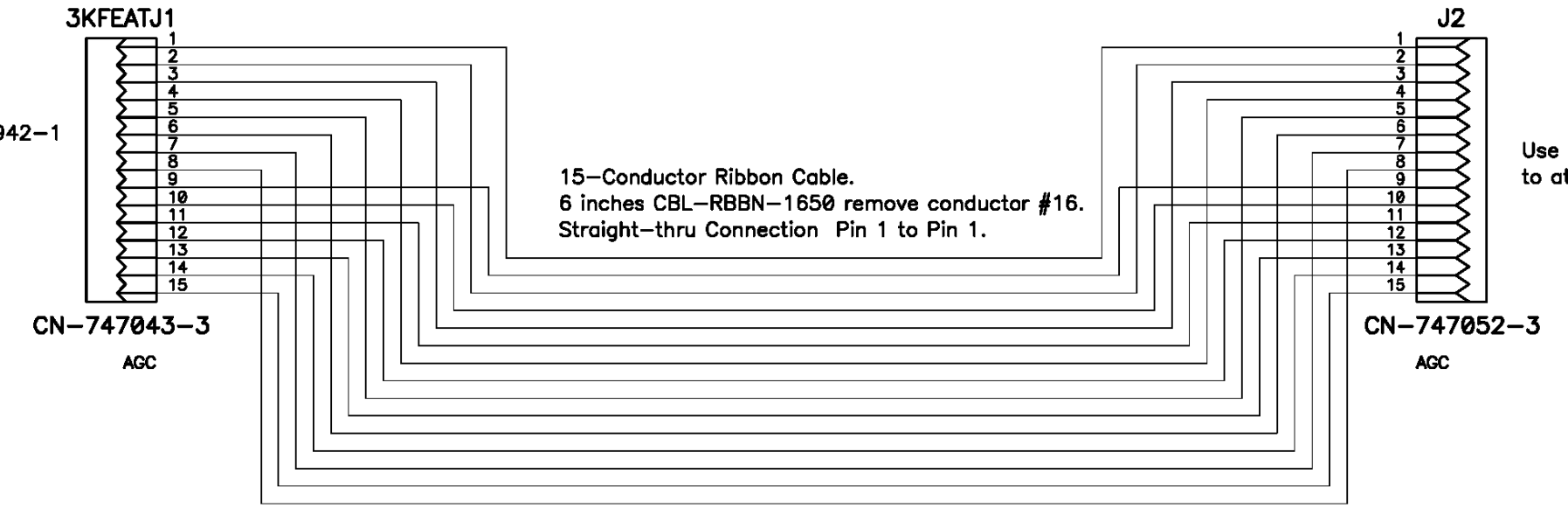
RIBBON 10

attach to PCB mounted DB-15F with
2pcs. each CN-206514-1 and CN-206942-1
post and clip kits.



Use 2 pcs. HD-205817-3
to attach at back panel

RIBBON 1

26-Conductor Ribbon Cable
8 1/2 inches of CBL-RBBN-2650.
Install a CN-499505-7 with CN-3448-89129 SRC
with Ribbon Cond.#1 on Pin 1.
trim back conductor #26.
Install CN-747052-2 on the other end with Ribbon
Cond.#1 on pin 1.

Use 2 pcs. HD-205817-3
to attach at back panel

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Yel, 16AWG, 8 Inch to FB-8097BAN3-J1-AZ1
Wht/Yel, 16 AWG, 8 Inch to FB-3KDPB02-J
Red, 16 AWG, 8 Inch to FB-8097BAN3-J1-EL1
Wht/Red, 16 AWG, 8 Inch to FB-8097BAN3-J1-EL2
Wht/Blue, 16 AWG, 8 Inch to FB-3KDPB02-H
BLUE, 16 AWG, 15 Inch to FB-3RELAY- POL-
Yel, 20 AWG, 24 Inch to RB1-A
Blk, 16 AWG, 14 Inch to A1-PG (Z-25A8)
Red,22 AWG, 24 Inch to RB2-B
Blk, 16 AWG, 14 Inch to A1-PG (Z-25A8)

to FC-3K-WG-DRV2, J2-2
to FC-3K-WG-DRV2, J2-8
to FC-3K-WG-DRV2, J2-12

Used only when ordered with the RC3000WG option

to FC-3K-WG-DRV2, J2-5
to FC-3K-WG-DRV2, J2-1
to FC-3K-WG-DRV2, J2-7

	A	AZ Mot + (CW)
	B	AZ Mot –
	C	EL Mot + (Down)
	D	EL Mot –
	E	POL Mot + (CCW)
	F	POL Mot –
	G	
	H	AZ Brake +
	J	AZ Brake –
	K	EL Brake +
	L	EL Brake –
	M	POL X-fer SW POS1, Pwr
	N	POL X-fer SW, Common
	P	POL X-fer SW POS2, Pwr
	R	
	S	
	T	
	U	
	V	
	W	
	X	POL X-fer SW Ind1, POS2
	Y	POL X-fer SW Ind, Common
	Z	POL S-fer SW Ind1, POS1
nc	a	POL X-fer SW Status2 POS2
nc	b	POL X-fer SW Status2 Common
nc	c	POL X-fer SW Status2 POS1
nc	d	AZ Tach +
nc	e	AZ Tach –
	f	
nc	g	EL Tach +
nc	h	EL Tach –
	j	
	k	
	l	
	m	

CN-9728-15S
CN-97-3102A28

J9
Motor Control

12 inch 22 AWG YELLOW wire to fc-3KF-WG-DRV3;K2:4
12 inch 22 AWG PURPLE wire to fc-3KF-WG-DRV3;MOV1:A/K3:4
12 inch 22 AWG BLUE wire to fc-3KF-WG-DRV3;MOV1:B/K3:13

Use 6 pcs CN-08-56-0110 Crimp Pins

To 3KFEAT J13

3KFEAT_J13

nc	1		
+12V Vehicle Battery	2	20 AWG RED	
Vehicle Ground	3	20 AWG GREEN	
nc	4		
nc	5		
EL Brake Relay COM	6		
EL Brake Relay NC	7		
+12V Vehicle Accessory Ckt.	8	20 AWG WHT	
1PPS o.c. output	9	20 AWG BLK	

CN-22-01-2097
3KFEAT_Acc.

9 inch 20AWG Orange wire to 8097BAN3 Terminal Block pin CC#2

27 inch 20 AWG Orange wire to RB2 pin A

J6

1		
2	HPA Disable NO	
3	+12V Vehicle Battery	
4	Vehicle Ground	
5	HPA Disable COM	
6	HPA Disable NC	
7		
8		
9	+12V Vehicle Accessory Ckt.	
	1PPS o.c. output	

CN-747905-2
Accessory
CN-7-DE09-SDSL

J6
Accessory

See Sheet 1 for revision history

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W-22AWG (10") Color as required

To 8097BAN3 J3

P3 Limit Switches

Pol Stow in	1	ORG
Pol Stow +12V	2	WHT
nc	3	
Limit Switch Shields	4	
EL Dwn +12V from EL Stow in	5	
EL Dwn in	6	RED/BLK
AZ Stow in	7	RED
nc	8	
AZ Stow +12V	9	
EL Up +12V	10	BLU
EL Stow +12V	11	WHT/ORG (h)
nc	12	
EL Stow in	13	GRN
EL Up in	14	GRN/BLK
	15	

CN-747908-2

attach to PCB mounted DB-15M with
2pcs. each CN-206514-1 and CN-206942-1
post and clip kits.

To 3K50FEAT J5

P4 Pulse Sensors

AZ-I Rtn	1	
AZ-I Pulse	2	WHT/BLK (R)
AZ-Q Rtn	3	
AZ-Q Pulse	4	WHT/GRAY (E+D)
EL-Q Pulse	5	WHT/YELLOW (f)
EL-Q Rtn	6	
EL-I Pulse	7	WHT/PURPLE (j)
EL-I Rtn	8	
AZ Shield	9	
AZ-I Pwr	10	
AZ-Q Pwr	11	
Alarm in	12	
EL-Q Pwr	13	
EL-I Pwr	14	
EL Shield	15	

CN-747909-2

attach to PCB mounted DB-15F with
2pcs. each CN-206514-1 and CN-206942-1
post and clip kits.

To 8097BAN3 J1
when used with
the resolver option
RC3000RSLVR

P1 AZ/EL/Pol Position

AZ pot wiper	1	BLK
AZ pot CW	2	YELLOW/BLK
Pol shield	3	WHT/GRN
Pol pot wiper	4	YELLOW
nc	5	
EL +15V	6	BLU/BLK
EL Shield	7	
EL -15V	8	GRAY
AZ pot CCW	9	WHT/BROWN
AZ shield	10	
Pol pot CCW	11	WHT/BLU
Pol pot CW	12	PURPLE
EL Sig Rtn	13	
EL Pwr Rtn	14	BROWN
EL Sig	15	ORG/BLK

CN-747908-2

attach to PCB mounted DB-15F with
2pcs. each CN-206514-1 and CN-206942-1
post and clip kits.

CN-97-3102-A28
CN-9728-21S

BLK	A	AZ Limit Common
WHT	B	POL Limit Common
RED	C	AZ Center Limit NO
	D	LHC C-band feed type NO
WHT/GRAY	E	RHC C-band feed type NO
WHT/BROWN R2 100	F	AZ Center NC
YELLOW/BLK	G	AZ CCW Limit NC
GRN R1 100	H	AZ CW Limit NC
	J	AZ CCW limit NO
ORG	K	EL Stow Limit NC
BLU	L	POL CW Limit NC
	M	POL CCW Limit NC
WHT/BLK	N	EL Limit Common
	P	East of Center Limit NO
RED/BLK	R	Ka, Ku, or C-band Lin feed type NO
GRN/BLK	S	AZ CW Limit NO
ORG/BLK	T	EL Down Limit NC
	U	EL Up Limit NC
BLU/BLK	V	Incl out +
BROWN	W	Incl out -
GRAY	X	Incl +12V
WHT/GRN	Z	Incl return
WHT/BLU	a	Incl -12V
YELLOW	b	Incl shield
PURPLE	c	Pol pot CCW
WHT/YELLOW	d	POL pot Wiper
	e	POL pot CW
WHT/ORG	f	Ka-band feed NO
WHT/PURPLE	g	feed type ?
	h	Feed type Common
	j	C-band feed type NO
	k	EL Stow NO
	m	EL Down NO
	n	EL Up NO
	p	Alarm/Ignit Interlock Common
	r	Alarm/Ignit Interlock N.O.
	s	Alarm/Ignit Interlock N.C.

J8
ANTENNA STATUS
when used with the
resolver option:
RC3000RSLVR

NOTES:
Pol Stow is located at POL CCW and is valid only when using an LP feed.

Use this sheet rather than sheet 1 with the RC3000 is ordered with the RC3000RSLVR option.

Notes:
J11 is used for the AZ potentiometer for the low-cost version and for the AZ Resolver when the RC3KRSLVR option is installed.

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