HD (Ka/Ku) Locals Job Aid

What's Inside...

KAKU Pre-set Pointing coordinates

DMA_DESCRIPTION	Azimuth	Elevation	Tilt	DMA_DESCRIPTION	Azimuth	Elevation	Tilt
Portland-Auburn ME	236	31	63	Monroe LA-El Dorado AR	196	51	76
New York NY	230	35	63	Birmingham AL	207	48	70
Binghamton NY	228	35	65	Ottumwa IA-Kirksville MO	194	43	80
Macon GA	215	48	64	Paducah KY-Cape Girardeau MO	201	45	75
Philadelphia PA	229	37	63	Odessa-Midland TX	170	54	93
Detroit MI	213	38	72	Amarillo TX	173	49	92
Boston MA	235	33	62	Austin TX	182	54	85
Savannah GA	218	47	62	Harlingen-Brownsville TX	182	59	84
Pittsburgh PA	220	39	67	Cedar Rapids-Waterloo IA	196	40	80
Fort Wayne IN	209	40	73	St Joseph MO	189	43	83
Cleveland OH	216	39	69	Jackson TN	203	47	73
Washington DC -	224	39	64	Memphis TN	200	47	75
Baltimore MD	226	38	63	San Antonio TX	179	56	87
Flint-Saginaw-Bay City MI	211	37	73	Lafayette LA	196	53	75
Buffalo NY	222	36	67	Lake Charles LA	193	54	77
Cincinnati OH	211	42	71	Alexandria LA	195	52	77
Erie PA	220	37	68	Greenwood-Greenville MS	199	49	75
Charlotte NC	219	44	64	Champaign-Springfield-	202	42	76
Greensboro - Winston-Salem NC	220	43	64	Evansville IN	205	44	73
Charleston SC	221	45	61	Oklahoma City OK	182	48	86
Augusta GA	217	46	64	Lubbock TX	173	51	91
Providence RI-New Bedford MA	235	33	61	Omaha NE	186	42	84
Columbus GA	211	48	67	Panama City FL	211	51	65
Burlington VT-Plattsburgh NY	232	32	64	Sherman TX-Ada OK	186	50	83
Atlanta GA	212	47	67	Green Bay-Appleton WI	203	37	78
Albany GA	214	49	64	Nashville TN	207	45	71
Utica NY	228	34	65	San Angelo TX	176	54	89
Indianapolis IN	207	41	73	Abilene-Sweetwater TX	178	52	88
Miami-Ft Lauderdale FL	225	53	54	Madison WI	200	39	79
Louisville KY	208	43	72	Fort Smith AR	191	48	81
Tallahassee FL	215	50	63	Tulsa OK	187	48	83
Tri-Cities TN-VA	216	43	67	Columbus-Tupelo-t MS	202	48	73
Albany-Schenectady-Troy NY	231	33	64	Peoria-Bloomington IL	201	41	77
Hartford-New Haven CT	233	34	62	Duluth MN-Superior WI	196	35	81
Orlando-Daytona FL	221	50	58	Wichita-Hutchinson KS	179	45	88
Columbus OH	214	40	70	Des Moines-Ames IA	191	41	82
Youngstown OH	218	38	68	Davenport IA-Rock Island IL-	198	41	78
Bangor ME	239	29	62	Mobile AL-Pensacola FL	206	51	69

KAKU Pre-set Pointing coordinates (cont)

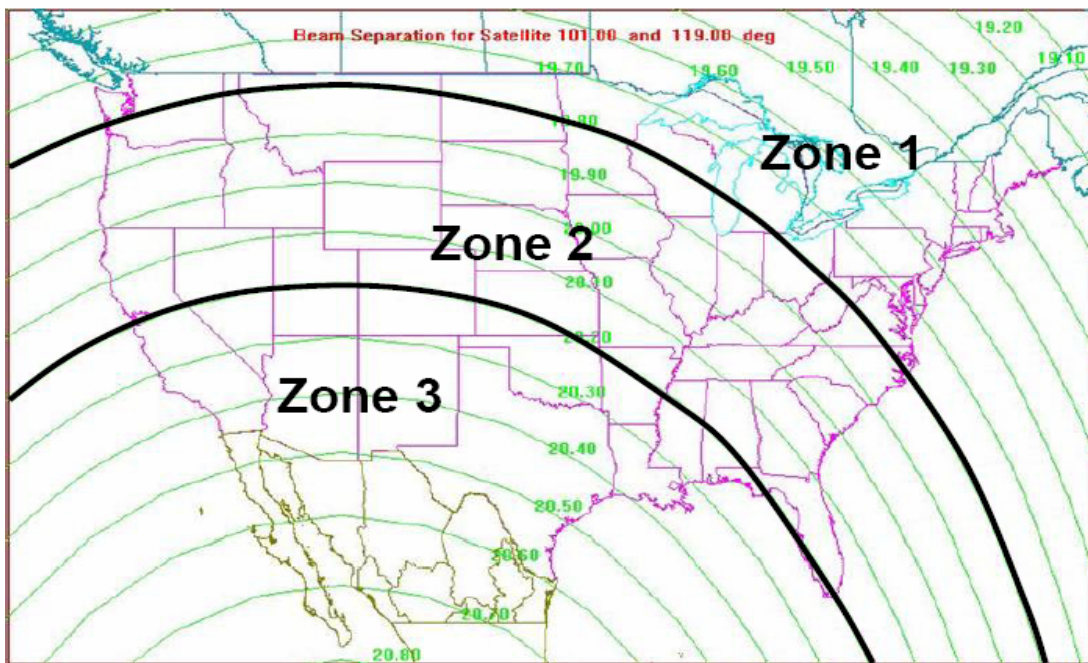| DMA_DESCRIPTION	Azimuth	Elevation	Tilt	DMA_DESCRIPTION	Azimuth	Elevation	Tilt
Rochester NY	224	35	67	Minot-Bismarck-Dickinson ND	173	36	91
Tampa-St Petersburg FL	220	51	59	Huntsville-Decatur AL	207	47	71
Traverse City-Cadillac MI	209	36	75	Beaumont-Port Arthur TX	191	54	79
Lexington KY	212	43	69	Little Rock-Pine Bluff AR	194	49	78
Dayton OH	211	41	71	Montgomery AL	208	49	68
Springfield-Holyoke MA	233	33	63	La Crosse-Eau Claire WI	197	38	80
Norfolk-Newport News VA	227	40	61	Wausau-Rhinelander WI	200	37	79
Greenville-New Bern-Washington NC	220	43	64	Tyler-Longview TX	189	52	80
Columbia SC	220	45	63	Hattiesburg-Laurel MS	202	51	72
Toledo OH	212	39	71	Meridian MS	204	50	71
West Palm Beach-Ft Pierce FL	225	51	55	Baton Rouge LA	198	53	74
Watertown NY	228	33	66	Quincy IL-Hannibal MO-Keokuk IA	197	43	79
Wilmington NC	224	43	61	Jackson MS	199	51	74
Lansing MI	210	38	73	Lincoln-Hastings NE	180	42	88
Presque Isle ME	240	28	63	Fargo-Valley City ND	184	35	87
Marquette MI	203	35	78	Sioux Falls SD	181	39	88
Wheeling WV-Steubenville OH	218	39	68	Jonesboro AR	197	47	77
Syracuse NY	226	34	66	Bowling Green KY	208	44	71
Richmond-Petersburg VA	225	40	63	Mankato MN	190	39	83
Knoxville TN	212	44	68	North Platte NE	176	42	90
Lima OH	211	40	71	Anchorage AK	NA	10	113
Bluefield-Beckley WV	218	42	66	Honolulu HI	93	21	155
Raleigh-Durham NC	224	42	62	Fairbanks AK	NA	10	108
Jacksonville FL-Brunswick GA	218	49	61	Biloxi-Gulfport MS	203	52	71
Grand Rapids-Kalamazoo MI	208	38	74	Juneau AK	121	18	109
Charleston-Huntington WV	216	41	68	Laredo TX	179	58	87
Elmira NY	224	36	66	Denver CO	167	44	95
Harrisburg-Lancaster PA	225	37	64	Colorado Springs-Pueblo CO	169	46	94
Greenville-Spartanburg SC-Asheville NC	215	45	66	Phoenix AZ	151	46	105
Harrisonburg VA	222	40	65	Butte-Bozeman MT	152	36	101
Myrtle Beach-Florence SC	222	44	62	Great Falls MT	157	34	98
Fort Myers-Naples FL	222	52	56	Billings MT	161	37	97
Roanoke-Lynchburg VA	221	41	65	Boise ID	142	37	106
Johnstown-Altoona PA	222	38	66	Idaho Falls-Pocatello ID	151	38	102
Chattanooga TN	211	46	68	Cheyenne WY-Scottsbluff NE	169	42	94
Salisbury MD	229	38	61	Twin Falls ID	148	39	104
Wilkes Barre-Scranton PA	226	36	65	Missoula MT	148	34	102
Terre Haute IN	204	42	74	Rapid City SD	170	40	93
Lafayette IN	205	41	74	El Paso TX	165	53	97
Alpena MI	212	36	73	Helena MT	152	35	100

KAKU Pre-set Pointing coordinates (cont)

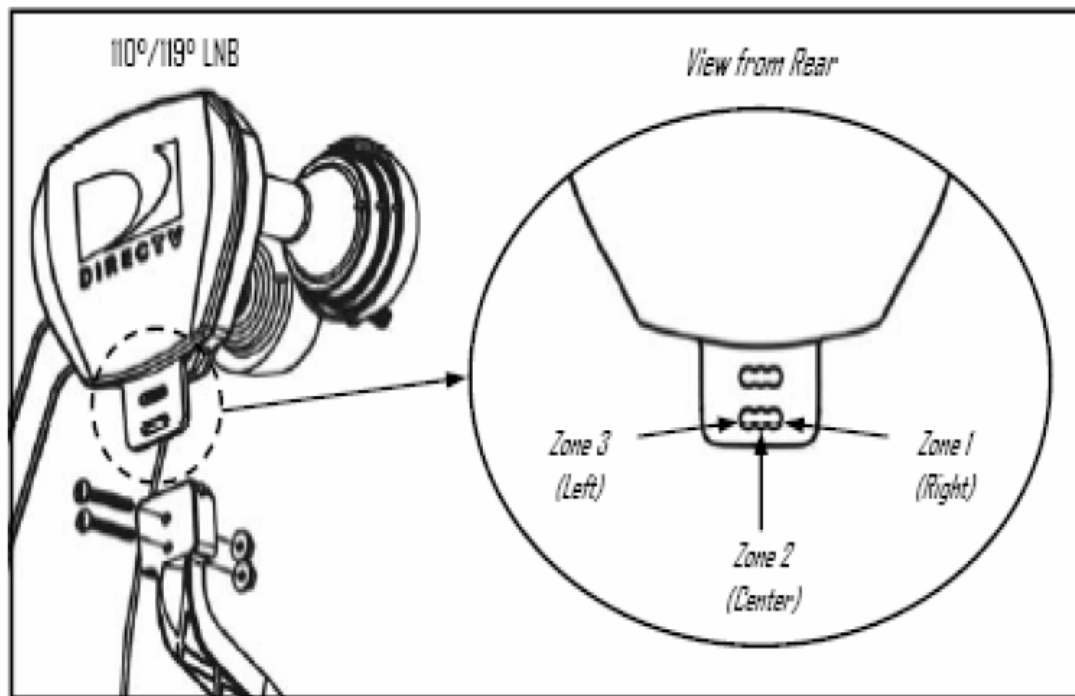| Pre-Set Pointing Coordinates for KaKu Dish All DMA's Included				Pre-Set Pointing Coordinates for KaKu Dish All DMA's Included			
DMA_DESCRIPTION	Azimuth	Elevation	Tilt	DMA_DESCRIPTION	Azimuth	Elevation	Tilt
Charlottesville VA	223	40	64	Casper-Riverton WY	162	40	97
South Bend-Elkhart IN	207	40	74	Salt Lake City UT	152	42	102
Gainesville FL	217	50	61	Yuma AZ	144	49	110
Zanesville OH	216	40	69	Grand Junction- CO	160	45	99
Parkersburg WV	217	40	68	Tucson AZ	152	51	106
Clarksburg-Weston WV	219	40	66	Albuquerque-Santa Fe NM	159	47	100
Corpus Christi TX	183	58	84	Glendive MT	167	36	94
Chicago IL	204	40	76	Bakersfield CA	136	45	114
Joplin MO-Pittsburg KS	189	46	82	Eugene OR	132	35	112
Columbia-Jefferson City MO	194	44	79	Eureka CA	131	37	114
Topeka KS	186	45	84	Los Angeles CA	140	46	112
Dothan AL	211	50	66	Palm Springs CA	142	48	111
St Louis MO	199	44	77	San Francisco-Oakland-CA	132	40	115
Rockford IL	201	40	77	Yakima-Pasco-Richland WA	136	34	107
Rochester MN-Mason City	193	39	82	Reno NV	137	42	111
Shreveport LA	191	51	79	Medford-Klamath Falls OR	134	37	111
Minneapolis-St Paul MN	191	37	83	Seattle-Tacoma WA	134	31	108
Kansas City MO	190	44	82	Portland OR	134	34	110
Milwaukee WI	203	39	77	Bend OR	134	36	110
Houston TX	188	55	81	San Diego CA	140	48	113
Springfield MO	194	46	79	Monterey-Salinas CA	133	43	115
New Orleans LA	200	53	72	Las Vegas NV	144	44	108
Dallas-Ft Worth TX	184	52	84	Santa Barbara-San Luis Obispo CA	134	44	115
Sioux City IA	186	41	85	Sacramento-Stockton-CA	134	41	113
Waco-Temple-Bryan TX	184	54	84	Fresno-Visalia CA	135	43	113
Victoria TX	185	56	83	Chico-Redding CA	133	38	113
Wichita Falls TX-Lawton OK	180	50	87	Spokane WA	141	34	105

ODU Assembly and Mounting

- **Assemble the ODU on the Ground**

- Assemble the 110°/119° LNB, bracket and interconnect cables but don't attach to LNB arm.

- The 110°/119° LNB has 3 sets of mounting holes for different regions, see the zone chart.

- When attaching the 110/119 LNB and setting the zones, insert the screws from the top to add additional support

- Preset AZ, EL and Tilt according to customers Zip code found in the guided setup of the H20 IRD (refer to peaking coordinates in this document).

- Pole mounts require at least 150LB of concrete

- Pole should be 2" OD and at least 16 ga.

- Pole should be 2' below ground and 4' above ground

- Pole should be modified so it will not spin (cut bottom of pole at an angle or insert bolt through bottom)

- Using the supplied bubble level, level the mast and tighten all necessary bolts.

- Attach the pre-assembled ODU to the AZ/EL hardware.
- Slide the AZ/EL and ODU hardware onto the installed mast, and tighten the mast clamp bolts just enough so the antenna has only side-to-side movement for later Azimuth alignment.
- Run all necessary cables into the feed arm attach LNB and run 4 cables to Ground block or Multi-switch; Use jumper from ground block or multi-switch to peak signal. DO NOT REMOVE LNB TO PEAK SIGNAL.
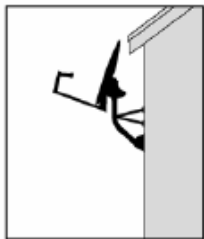- Assemble the LNBs using the provided hardware

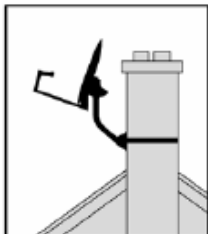# LNB Zone Chart

LNB zone settings
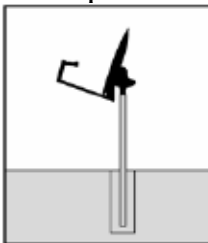
ODU Mounting Options

Wall mounts require the use of two monopoles
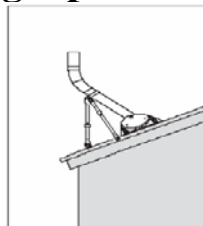

Balcony mounts require the use of one monopole

Chimney mounts do not require the use of a monopole

Pole mounts should be 2 feet below and 4 feet Above ground (pole should be 2" OD and 16 ga.)

Roof mounts require the use of two monopoles
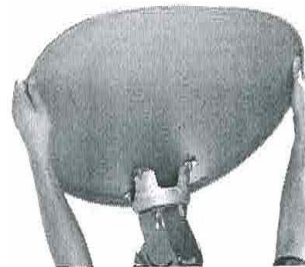
Monopoles are available in 2 lengths 19" and 32"

ODU Peaking and Fine Tuning

Coarse align the Azimuth and Elevation

- Set the in-line signal meter for 101° RHCP(13 volts with no 22 KHz tone).

- Slowly rotate the antenna around the mast in the Azimuth direction until a peak level is obtained, and then lock down the mast clamp bolts.

- Using a ½" nut driver, adjust the fine elevation screw for maximum signal level. If the fine elevation screw runs out of range, or is not centered in its range of movement, loosen the elevation lock down screw and move the coarse elevation slightly to keep the bolt centered.

- Record the Coarse signal level at this point for comparison during a later step.

- **IMPORTANT: <u>DO NOT</u>** Connect a signal meter directly to the 110°, 119° LNB/Doing so will cause the 110°, 119° LNB to fail beyond repair.
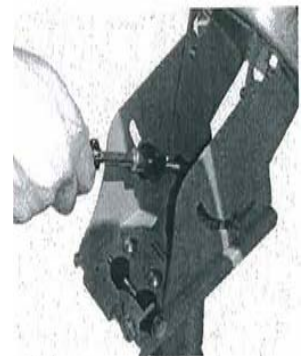
Fine-tuning the Tilt

- Set the in-line signal meter for 119° RHCP reception (13 volts with 22KHz tone)

- Slowly rotate the dish (left/counter clockwise, right/clockwise), around the tilt axis, in order to peak the 119° signal, then carefully tighten the Tilt lockdown nuts

- The KaKu ODU currently has 3 different manufactures -Winstron,Cal Amp and Andrew corp. All variations are fine tuned and peaked the same manner described above
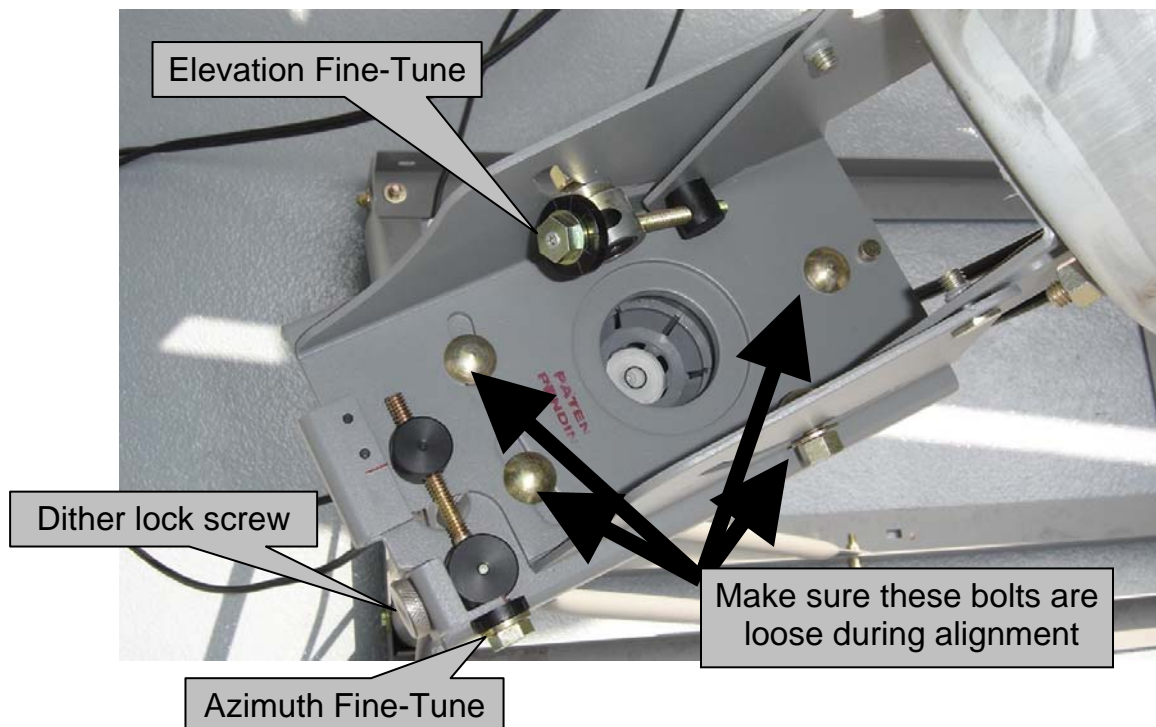
Fine-tuning the Elevation

- Set the in-line signal meter for 101° RHCP reception (13 volts with no 22 KHz tone).

- Looking at the back of the ODU, lock down the Left side Elevation bolt, leaving the Right side slightly loose.

- With the Elevation having been coarse peaked previously, now grasp the plastic Elevation readout dial and rotate until 0 (zero) is lined up with the indicator (be careful not to turn the Elevation fine adjustment bolt during this step).

- Using a ½" Nut Driver, rotate the Elevation fine tune screw exactly 2 turns Counter Clockwise and record the level from the signal meter. (This level will be lower than that obtained in the Elevation coarse peak.)

- Note this signal level

- While counting the exact number of turns as well as fractions of a turn, rotate the Elevation fine tune screw Clockwise (through the Peak) and continue until an identical signal level is reached as that recorded from the last step (roughly 5-7 turns). The numbers will be incrementing in reverse order, thus the number displayed on the dial will not correspond directly to the total distance turned.

    - EXAMPLE: If you stop on 6 you actually moved 4 increments clockwise past zero, not 6.
    - Record the number of turns

- Divide the number of turns just recorded by 2. Then rotate the Elevation fine-tune screw Counter Clockwise by this amount.
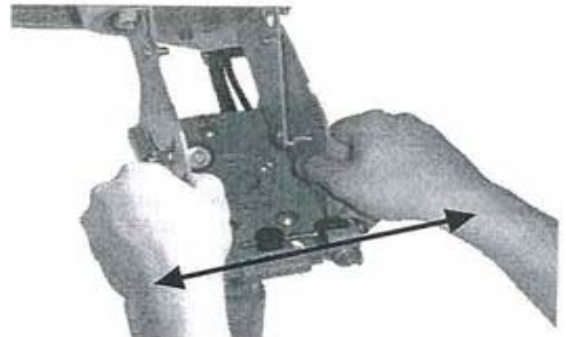
- Tighten the Elevation lock down nut.

Fine-tuning the Azimuth

- The Azimuth fine-tuning procedure uses identical signal readings either side of peak in order to arrive at precise alignment.
- Verify that the Azimuth lock down bolts are slightly loosened so as to allow free movement of the dither mechanism
- Set the in-line signal meter for 101° RHCP reception (13 volts with no 22 KHz tone).
- Unscrew and pull out the Dither lock pin and verify dish will move slightly side to side without binding.
- Make sure to start with the azimuth dither pin centered.

Elevation Fine-Tune

Dither lock screw

Make sure these bolts are loose during alignment

Azimuth Fine-Tune

- Move the dish fully to the Left against the dither stop and read the signal level. This level will be lower than that obtained during coarse Azimuth peak.

• Move the dish fully to the Right against the opposite dither stop and compare the signal level to the previous reading
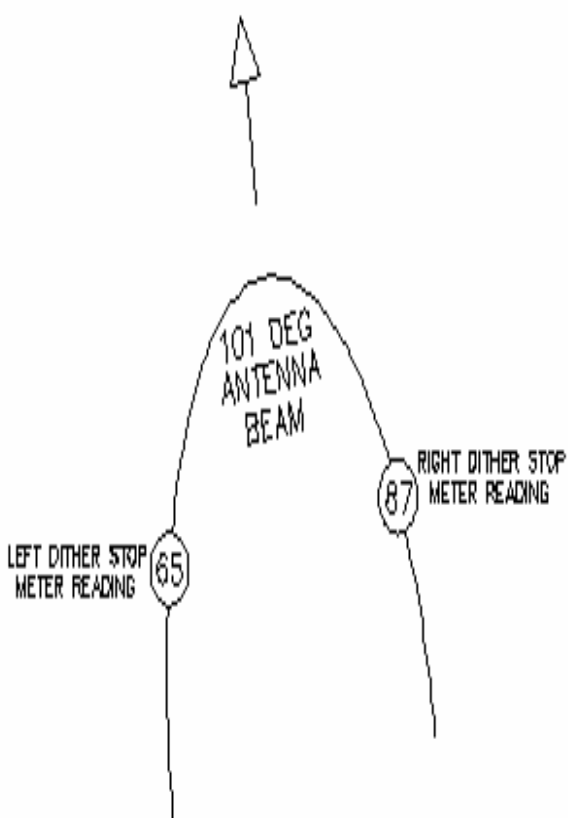
- Turn the Azimuth fine adjustment screw to increase the lower of the two signal levels and repeat left/right dither process until identical signal levels are achieved for the Left and Right stops. You may have to make several adjustments to achieve identical signal level
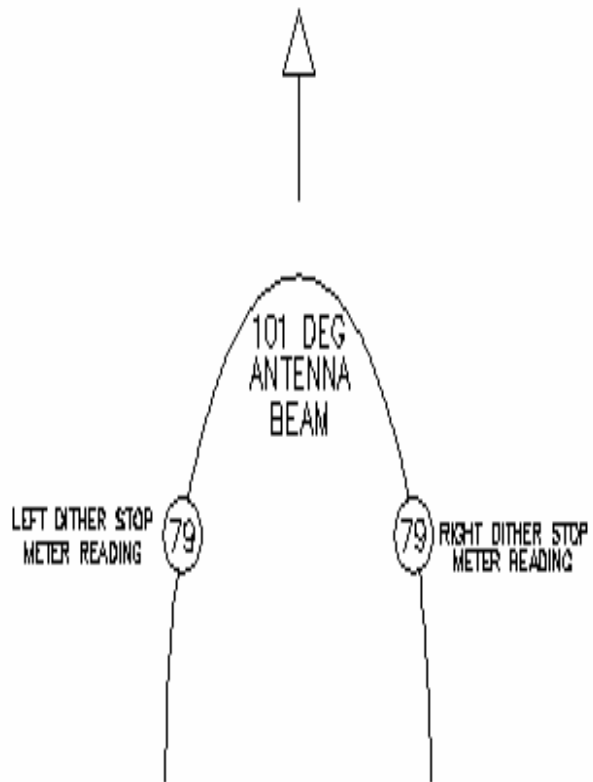
- When signal levels are **exactly** the same at the left and right dither stops, then move the dish to the center of the dither range and replace the dither lock pin. You may need to move the dish slightly side to side until the lock pin is fully engaged.

- Tighten the Azimuth lock down bolts.

- The current signal level should now be equal to or greater than what was recorded for coarse alignment. A lower level would indicate a possible alignment problem and will require repeating the Fine-tune steps.

- Verify adequate signal levels are available for 101°, 103°, 110°, and 119° using the signal meter in the H20 IRD.

    -If they are low, repeat the Fine-tuning steps

- You can damage the mount if threads bottom out and you keep turning the fine-tune screws.
- Strive for identical levels between the left and right dither stops.
- Give the meter enough time to stabilize the readings at each dither stop.
- Move to the left and right dither stop by grasping the rear of the mount, **do not use the reflector/ODU.**

101 DEG ANTENNA BEAM

RIGHT DITHER STOP METER READING (87)

LEFT DITHER STOP METER READING (65)

Before Dither Alignment
Different Meter Readings
At Left & Right Dither Stops

101 DEG ANTENNA BEAM

LEFT DITHER STOP METER READING (79)

(79) RIGHT DITHER STOP METER READING

Fine AZ Adjusted For
Identical Meter Readings
At Left & Right Dither Stops

Multi-Switch Requirements

- If customer requires more than 4 lines you must use the new wide band 6x8.

- If customer requires programming from 95º or 72.5º you must use the new wide band 6x8.

- Existing 4x8 and 6x8 are not compatible due to frequency range requirements.
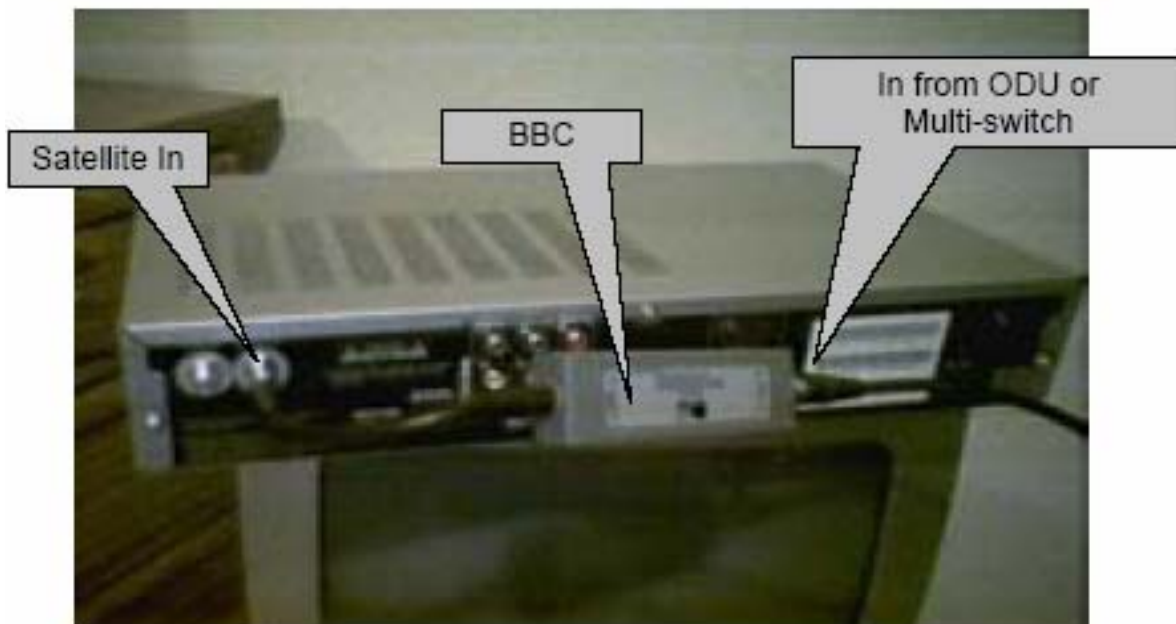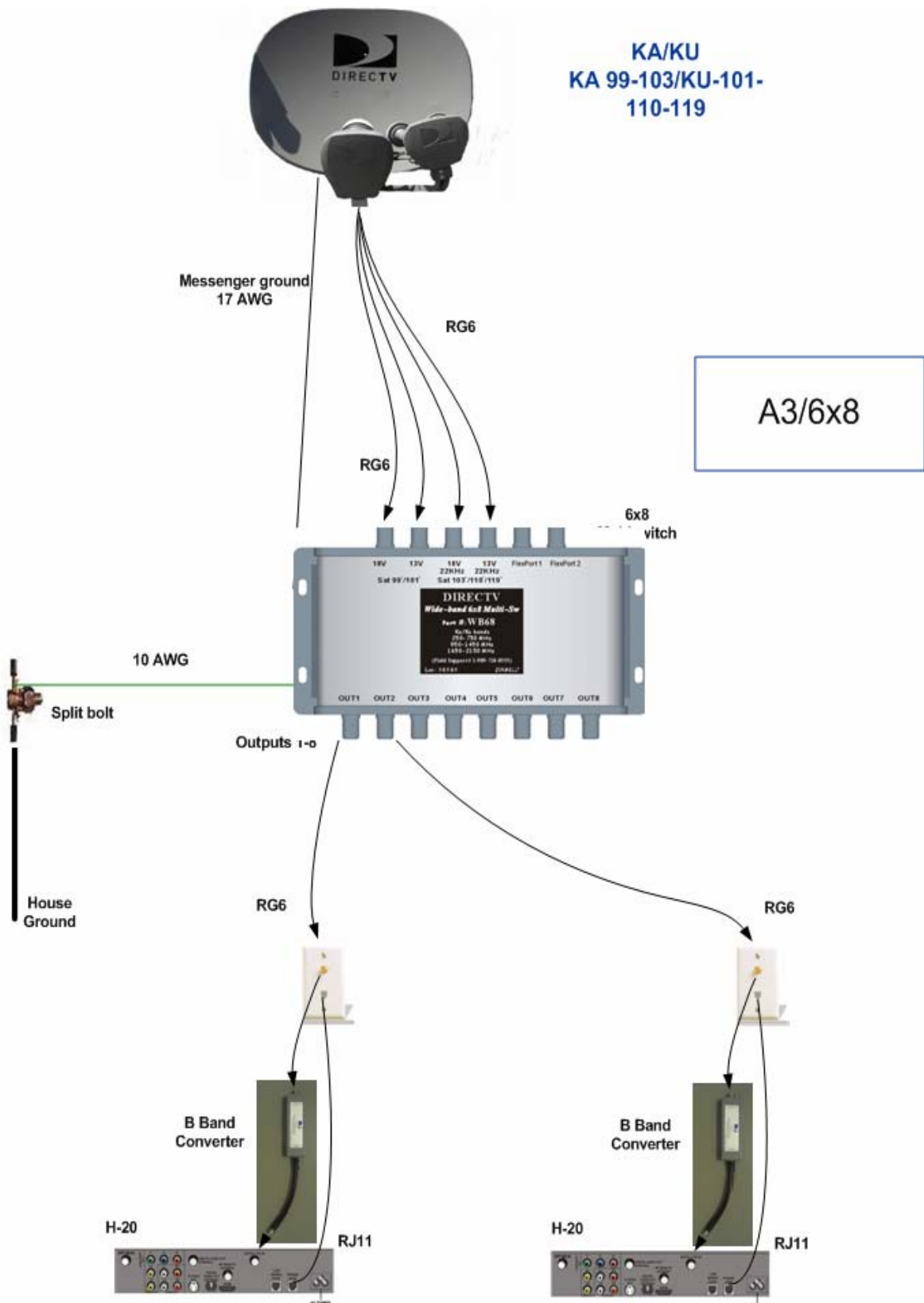
New wide band 6x8

Hooking up the HD (Ka/Ku) IRD

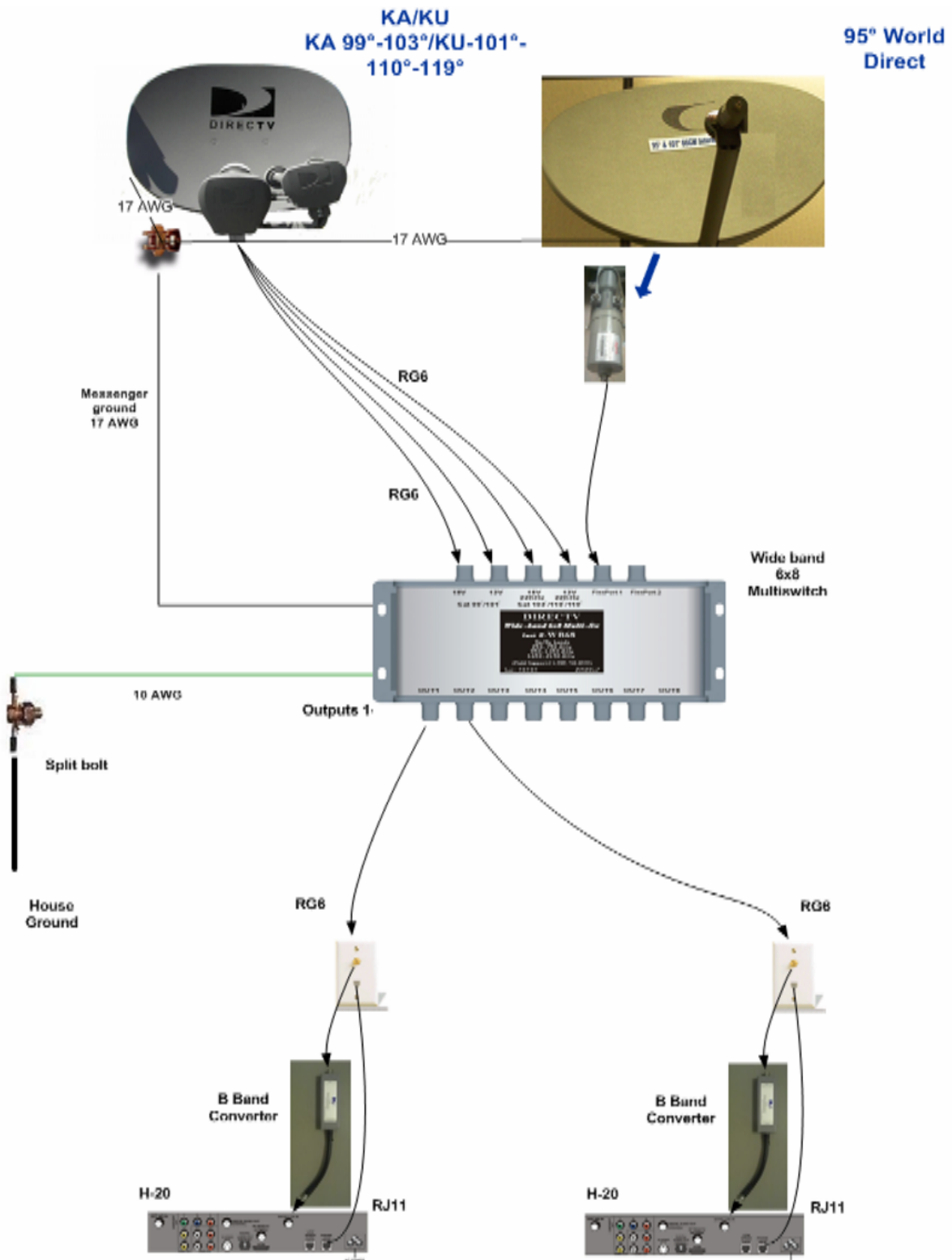- The B band converter (BBC) is required to be installed on every H20 IRD--**it must be installed directly behind the IRD**.
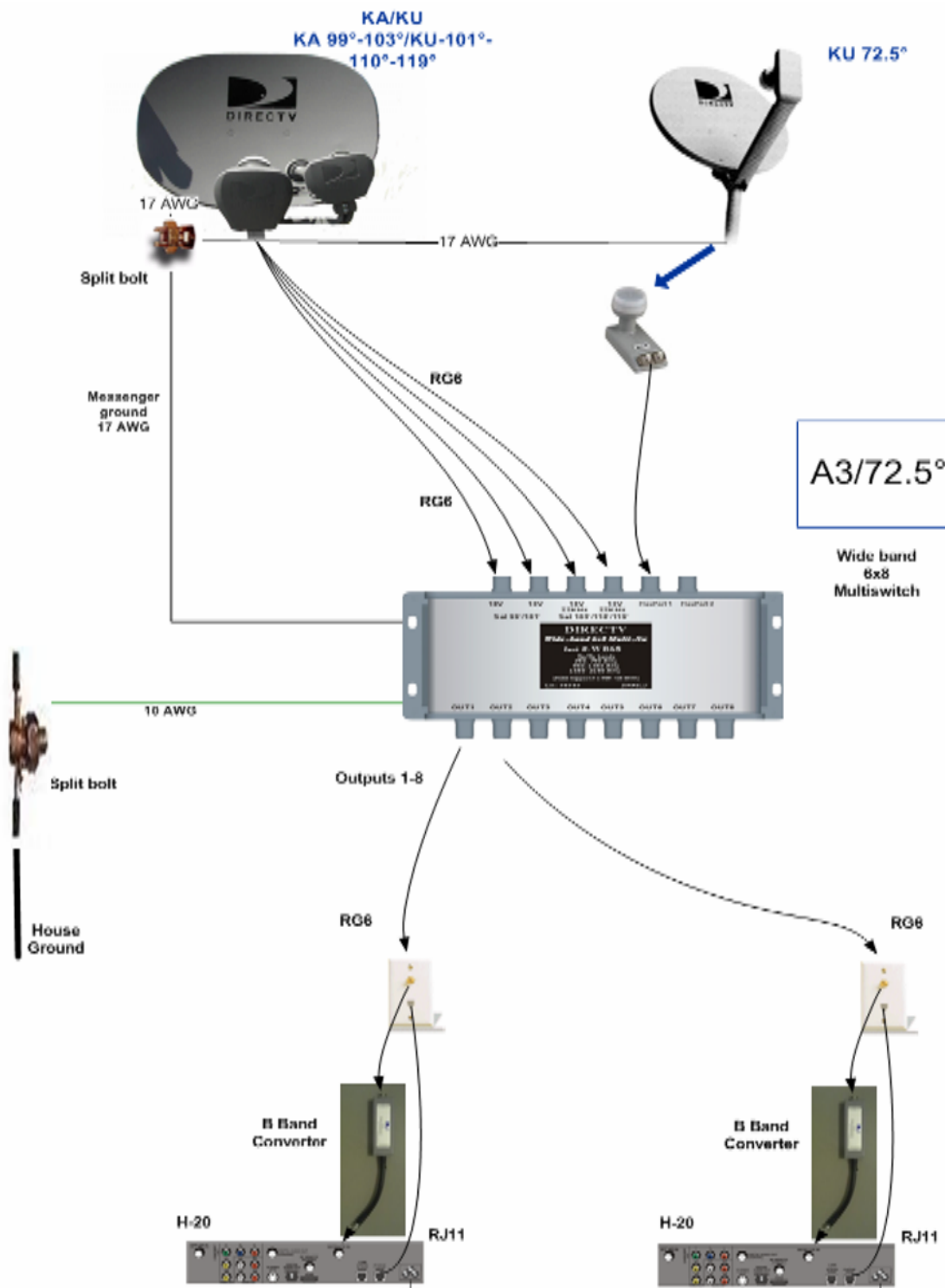

- Hook up Satellite feed coming from ODU or approved Multi-switch into the Ka LNB input on the BBC.

- Hook up the BBC to the satellite input on the back of the H20 IRD.

- If applicable hook up the dedicated line from the off air antenna in to the antenna input on the H20 IRD

KA/KU
KA 99-103/KU-101-
110-119

Messenger ground
17 AWG

RG6

RG6

A3/6x8

6x8
vitch

18V   13V   18V   13V   FlexPort1 FlexPort 2
             22KHz 22KHz
Sat 99'/101' Sat 103'/110'/119'

DIRECTV
Wide-band 6x8 Multi-Sw
Part # WB68

OUT1 OUT2 OUT3 OUT4 OUT5 OUT6 OUT7 OUT8

10 AWG

Split bolt

Outputs 1-8

House
Ground

RG6

RG6

B Band
Converter

B Band
Converter

H-20

RJ11

H-20

RJ11

KA/KU
KA 99°-103°/KU-101°-
110°-119°

95° World
Direct

17 AWG

17 AWG

RG6

Messenger
ground
17 AWG

RG6

Wide band
6x8
Multiswitch

10 AWG

Outputs 1-

Split bolt

House
Ground

RG6

RG6

B Band
Converter

B Band
Converter

H-20

RJ11

H-20

RJ11

KA/KU
KA 99°-103°/KU-101°-110°-119°

KU 72.5°

17 AWG

17 AWG

Split bolt

Messenger
ground
17 AWG

RG6

RG6

A3/72.5°

Wide band
8x8
Multiswitch

10 AWG

Split bolt

Outputs 1-8

House
Ground

RG6

RG6

B Band
Converter

B Band
Converter

H-20

RJ11

H-20

RJ11

Technician Notes

(For technical help call Installation and Service Support @ 1-800-778-3431 Mon – Sat 7AM – 6PM MT.)