DELTA - 4B SERIES

LIGHTNING SURGE PROTECTED
4 POSITION RF COAX SWITCH
WITH FIELD-REPLACEABLE SURGE PROTECTOR PILL

THE MODEL DELTA-4 SWITCH IS A PRECISION RF SWITCHING
DEVICE EMPLOYING THE LATEST HIGH TECHNOLOGY DESIGNS

NOTE: SAME DATA APPLIES FOR DELTA-2B
TWO POSITION SWITCH

--SPECIFICATIONS--

POWER RATING- 1.5 kW
PEP/CW

IMPEDANCE- 50 OHMS

SWITCH POSITIONS
Four, two either side of the "common" center, connector.

CONNECTORS-
DELTA-4B, type UHF;
DELTA-4B/N, type N

LIGHTING SURGE PROTECTION
Alpha Delta Model D-4 internally mounted, field-replaceable ceramic
gas tube Arc-Plug Cartridge Pill.

SPECIAL SWITCHING FUNCTIONS
When the knob points to the center (ground) switch position, all
antenna circuits are internally disconnected and grounded. When the
knob is in an active position, the unused antenna ports are grounded.
The active position circuit is continuously protected by the Model D-4
Arc-Plug Cartridge Pill.

GROUNDING REQUIREMENTS
A separate, external ground wire must be used from one set of user
supplied mounting hardware (through either thru-hole on the base
plate) to the station ground system. (Not the equipment chassis.) The
Arc-Plug Cartridge Pill will not operate without a good ground. Note:
Paint should be removed at point of ground hardware connection to
base plate. It is also good practice to ground the coax shield at point of
entry to the building.

ELECTRICAL SPECIFICATIONS
Nominal (S0-239 CONNECTORS)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>VSWR</th>
<th>dB Loss</th>
<th>dB Isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 MHz</td>
<td>&lt;1.1:1</td>
<td>.1 dB</td>
<td>&gt;60 dB</td>
</tr>
<tr>
<td>150 MHz</td>
<td>&lt;1.3:1</td>
<td>.15 dB</td>
<td>&gt;50 dB</td>
</tr>
<tr>
<td>450 MHz</td>
<td>&lt;1.4:1</td>
<td>.5 dB</td>
<td>50 dB</td>
</tr>
</tbody>
</table>

PRICES & SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

These devices are not intended to protect equipment, personnel or structures from the effects of a direct lightning strike as these events are un-predictable in strength and vary widely in severity, possibly well above our surge handling specifications. However, these devices are designed to
provide effective equipment protection from antenna induced atmospheric surge voltages resulting from electrical static voltage discharges and
nearby lightning induced voltage discharges, within the ratings of these devices.

NOTE: Model DELTA-2B/N has NSN 5985-01-551-0890 and number AN/URN-31(V), auto ID
system, for MIL users as assigned by the Defense Logistics Agency (DLA). Cage Code 389A5

The Models DELTA-2B/N, DELTA-4B/N and DELTA-2B/TNC have typical loss of 0.5 dB at 1.6 GHz
ARC-PLUG® CARTRIDGE REPLACEMENT

Additional D-4 Arc-Plug® Cartridge Pills are available from Alpha Delta or your dealer at a nominal cost. Replacement in the field is quite easy, and the only tool required is a screwdriver.

Should a severe lightning hit occur, the ceramic gas tube Arc-Plug® Cartridge Pill will short to ground protecting your equipment. The pill will remain shorted however (unlike its recovery to open circuit condition after a less severe hit or transient) and must be removed or replaced in order to continue operation. If replacement pill is not immediately available you can continue operation (without lightning transient protection) by removing the shorted pill from the switch until you obtain its replacement.

To replace the pill, use a screwdriver to remove the front panel access screw by turning it counter clockwise. Then, turn the switch upside down until the Arc-Plug® Cartridge Pill drops out of the access hole. Now, turn the switch right side up, drop the new Arc-Plug® Cartridge Pill into the access hole. (Make sure the Pill is lying with its metal surface up) then, insert the set screw and tighten it in a clockwise direction with the screwdriver until finger tight. (CAUTION-Over tightening of the set screw can damage the Arc-Plug® Pill.)

Note: The Alpha Delta Model D-4 Arc Plug® Cartridge Pill is designed to reduce the hazards of lightning induced, or other high voltage induced surges. This device, however, will not prevent fire or damage caused by direct lightning strike to an antenna, power lines or other structure.

Caution: Do Not change switch positions while RF is applied; or when the back cover is removed. This can cause damage to the switch contacts and such damage will not be covered by our warranty.

APPLICATION INFORMATION

The model Delta-4 switch can be used in several different applications, depending upon the installation configuration.

A. Multiple Antenna, Single RCVR/XCVR Application - Connect the "jumper" coax from the RCVR/XCVR to the "common" connector on the switch. Connect antennas/dummy load to your choice of positions 1,2,3, or 4 on the switch.

B. Multiple RCVR, Single Antenna Application - Connect the single antenna coax to the "common" position on the switch. Connect RCVR "jumpers" to your choice of positions 1,2,3, or 4 on the switch.

Note: Switch specifications, including co-channel isolation in dB, are guaranteed only when using properly installed 50 ohm coaxial cable. Single wire "jumpers" or antenna feeds do not provide proper isolation or VSWR characteristics. For transmitting, any model must be placed at a point in the coax line where VSWR does not exceed 2:1 to prevent high RF voltages from triggering the Arc-Plug® Pill.

Note: The Models DELTA-( )B series switches, in either type N, SO-239 or TNC connector styles, can be used in Multiple Transceiver/Transmitter, Single Antenna Applications—Connect the single antenna coax to the "common" position on the switch. Connect XCVR/XMTR "jumpers" to your choice of positions 1, 2, 3 or 4 on the switch.

The 50-60 dB typ. co-channel isolation provided by these switches is more than adequate to prevent equipment damage, assuming equipment and switches are properly installed and grounded, as per the instructions. Note SWR caution above with regard to switch placement.
Suggestions for connecting multiple antennas to multiple rigs utilizing Model DELTA4-B (4 position) coax antenna switches. Antenna types and rigs are samples from a customer request. Model DELTA-2B (2 position) switches can be used for lesser antenna/rig requirements.

As an example of the operation, if you placed switch 1 in position 1 and switch 2 in position 1, the “HF antenna” would routed through to the “IC 7000”.

Note the “COM” connector on switch 1 is routed to the “COM” connector on switch 2 with a jumper coax. Then, both switches have complete versatility for multiple rigs and multiple antennas.

**WARNING:** DO NOT tighten D-4 ARC-PLUG pill. It is factory adjusted. Over tightening will damage internal switch circuits and will not be covered by warranty.
CAUTION: The Model D-4 gas tube ARC-PLUG cartridge has been installed and carefully adjusted at the factory. It passes surge voltages to ground through the device, but does not pass RF.

DO NOT attempt to tighten or adjust this device as over tightening will damage the switch thru-line circuits. If the Model D-4 cartridge needs replacement, follow the instructions on the previous sheets. When installed, adjust the set screw so it is only JUST FINGER TIGHT! Do NOT screw it down tight with a screw driver.

Unless the switch takes a surge beyond its rating, is operated at high VSWR (over 2:1 at the point of installation) with high power (1500 watts), or “hot switched” while transmitting, the need for replacement is very rare.

The need for replacement is indicated by a “dead” receiver or infinite SWR on tune up. This is because the Model D-4 fails in the “fail safe” mode and shorts itself to ground. The equipment is therefore protected until replaced. This switch can be operated normally without the Model D-4 installed, but without equipment protection.

Over tightening and switch thru-line damage will not be covered by warranty.