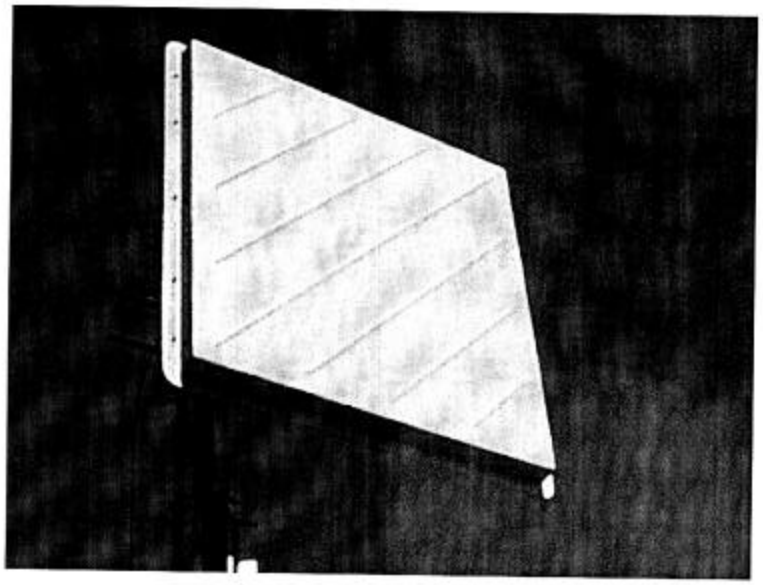
ANT-PNL-22 Specifications

Frequency	2.4000 to 2.4835 GHz
Net Gain	21.2 dBi
3dB beam width	10 degrees
Front to back ratio	>32 dB
Polarity	Vertical (default) or horizontal, field changeable
Cross polarity rejection	>30dB
VSWR (Average)	1.5:1
Impedance	50 ohms
Coaxial pigtail length (to ODU)	36 inches
Wind loading @ 100 MPH	168 lbs
Wind loading @ 140 MPH	329 lbs
Elevation adjustment	45 degrees
Size	24 in x 24 in x 1.5 in
Weight	15 lbs
Reflector material	Aluminum/plastic
Mounting hardware	Aluminum/steel
Mast diameter	2 3/8 inches OD

July 29, 1998



COMSAT RSI Wireless Antennas — *Innovation* YOU CAN RELY ON

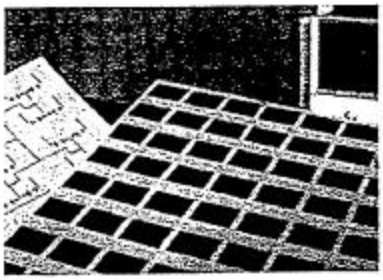
FCC ID: KA324WAN4 ANT-PNL-21 Page 33 (a)

2.4 GHz Array Antenna

Take advantage of unlicensed frequency bands with COMSAT RSI Wireless Antennas' new flat panel antennas. These products are designed to work with spread spectrum radios at 2.3-2.5 GHz.

Especially in urban environments, where aesthetics and zoning are critical, the sleek 2'x2'x1½" panel design is an attractive alternative to solid and grid parabolic antennas.

Panel antenna technology provides many benefits besides attractive packaging. This technology, developed by COMSAT RSI Wireless Antennas, brings intrinsic tolerance control, resulting in virtually identical antenna performance from one product to the next. Additionally, the photolithographic microstrip process results in high-production yields and cost savings that is passed on to our customers.



Electrical Specifications

Frequency	2.4-2.5 GHz
NetGain	20.2dBi
Half Power Beamwidth	10°
Polarization	Vert. or Horz.
Front-to-Back Ratio	32dB
VSWR	1.5
Connector	Type N or 7/16 DIN
Input Power	100 watts
Assembly Resistor	5 kohm

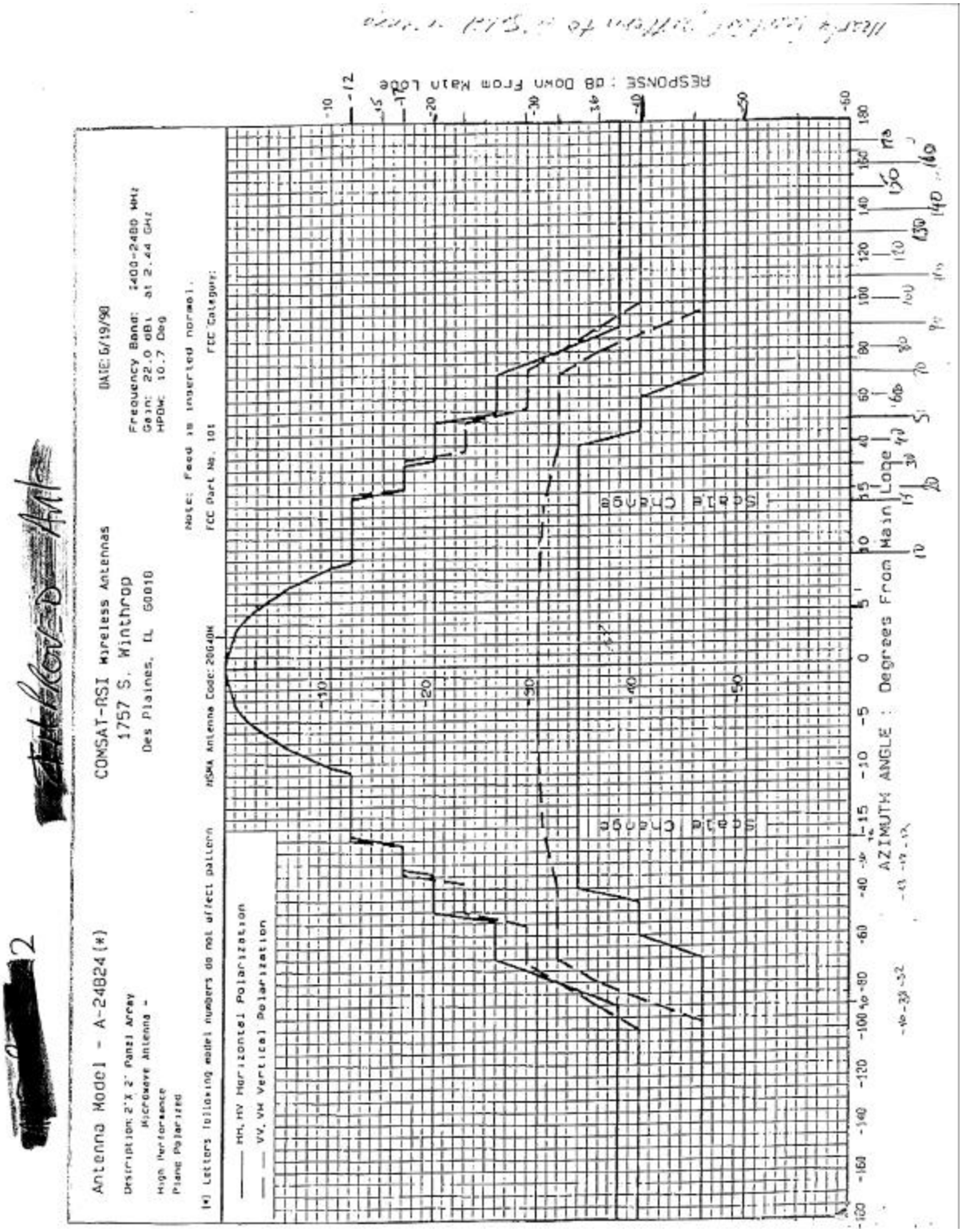
Mechanical Specifications

Dimensions	24in x 24in x 1½in
Max. Operating Wind Speed	100 mph
Elevation Adjust	±45°
Weight - Antenna	15 lb
Mount	Wall or Pipe

102097B

COMSAT RSI Confidential Information

http://www.wirelessantennanet.com


RESPONSE : dB Down From Main Lobe
AZIMUTH ANGLE : Degrees From Main Lobe
Antenna Model - A-24824(*)
CONSAT-RSI Wireless Antennas
1757 S. Winthrop
Des Plaines, IL 60018
DATE: 6/19/98
Frequency Band: 2400-2480 MHz
Gain: 22.0 dBi at 2.44 GHz
HPBW: 10.7 Deg
Description: 2'X 2' Panel Array
Microwave Antenna -
High Performance
Plane Polarized
(*) Letters following model numbers do not affect pattern
Note: Feed is inserted normal.
FCC Part No. 101
FCC Category:
HSMA Antenna Code: 20G40W
HH, HV Horizontal Polarization
VV, VH Vertical Polarization

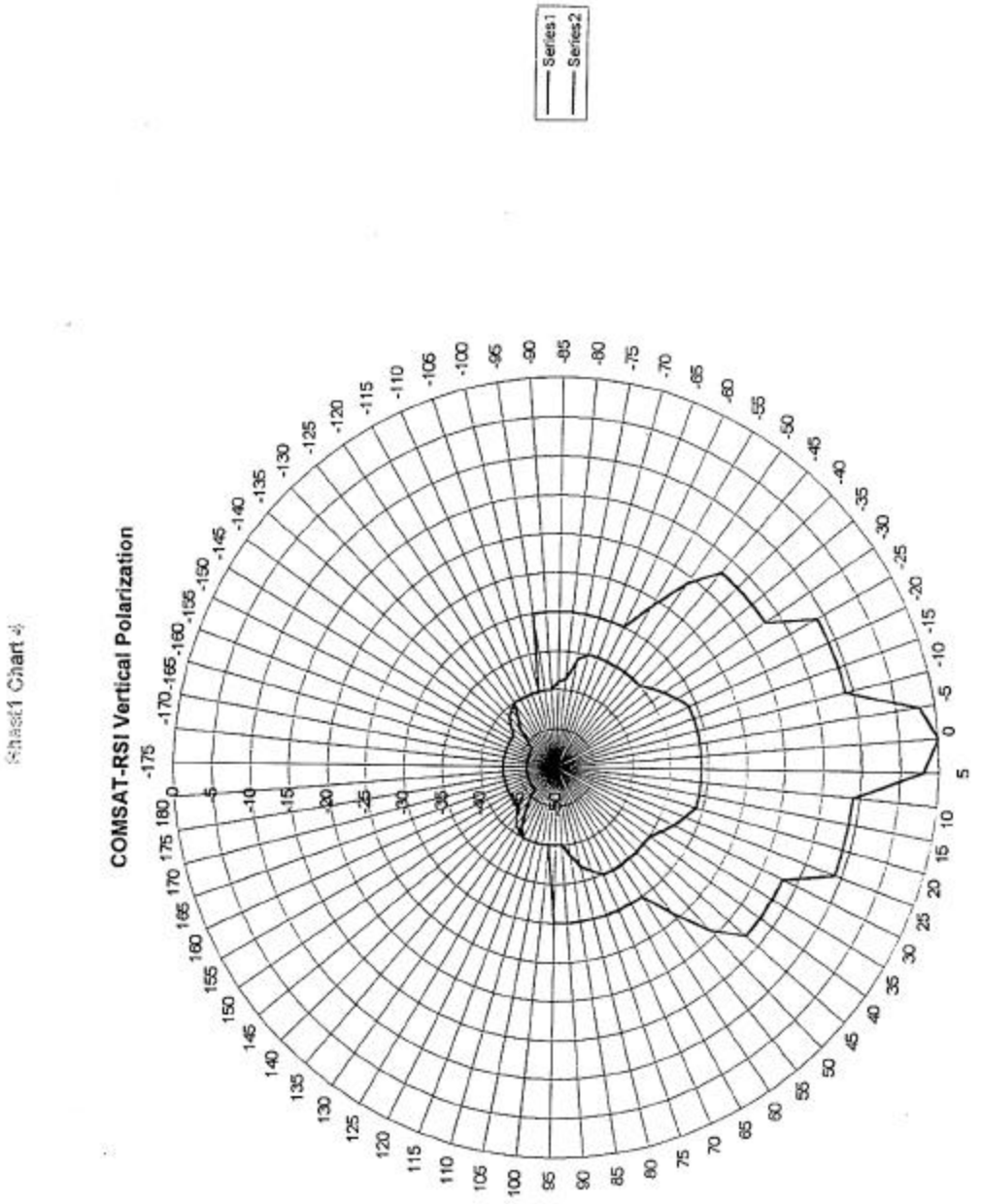
Model: 24" X 24" PANEL Date: 10/8/97

Table of LPE Breakpoints for Pattern on reverse side.

HH Angle (DEG)	HH Response (dB)	HV Angle (DEG)	HV Response (dB)	VV Angle (DEG)	VV Response (dB)	VH Angle (DEG)	VH Response (dB)
-180.0	-36.0	-180.0	-50.0	-180.0	-43.0	-180.0	-46.0
-174.0	-36.0	-130.0	-50.0	-140.0	-43.0	-140.0	-46.0
-170.0	-38.0	-90.0	-43.0	-120.0	-40.0	-120.0	-40.0
-110.0	-38.0	-60.0	-43.0	-100.0	-40.0	-90.0	-40.0
-70.0	-26.0	-50.0	-38.0	-90.0	-30.0	-70.0	-35.0
-54.0	-26.0	-40.0	-38.0	-60.0	-30.0	-40.0	-35.0
-50.0	-21.0	-30.0	-31.0	-44.0	-17.0	-20.0	-31.0
-40.0	-21.0	30.0	-31.0	-26.0	-17.0	20.0	-31.0
-32.0	-16.0	40.0	-38.0	-24.0	-11.0	40.0	-35.0
-22.0	-16.0	50.0	-38.0	-9.5	-11.0	70.0	-35.0
-20.0	-11.0	60.0	-43.0	-9.2	-10.0	90.0	-40.0
-9.5	-11.0	90.0	-43.0	-7.5	-6.0	120.0	-40.0
-9.2	-10.0	110.0	-50.0	-5.5	-3.0	140.0	-46.0
-7.5	-6.0	180.0	-50.0	-4.6	-2.0	180.0	-46.0
-5.5	-3.0			-3.5	-1.0		
-4.6	-2.0			0.0	0.0		
-3.5	-1.0			3.5	-1.0		
0.0	0.0			4.6	-2.0		
3.5	-1.0			5.5	-3.0		
4.6	-2.0			7.5	-6.0		
5.5	-3.0			9.2	-10.0		
7.5	-6.0			9.5	-11.0		
9.2	-10.0			24.0	-11.0		
9.5	-11.0			26.0	-17.0		
20.0	-11.0			44.0	-17.0		
22.0	-16.0			60.0	-30.0		
32.0	-16.0			90.0	-30.0		
40.0	-21.0			100.0	-40.0		
50.0	-21.0			120.0	-40.0		
54.0	-26.0			140.0	-43.0		
70.0	-26.0			180.0	-43.0		
110.0	-38.0						
170.0	-38.0						
174.0	-36.0						
180.0	-36.0						

NOTE: The LPE on the front side is formed by connecting these points with a straight line.

HH = Horizontal port response to a horizontal signal
HV = Horizontal port response to a vertical signal
VV = Vertical port response to a vertical signal
VH = Vertical port response to a horizontal signal



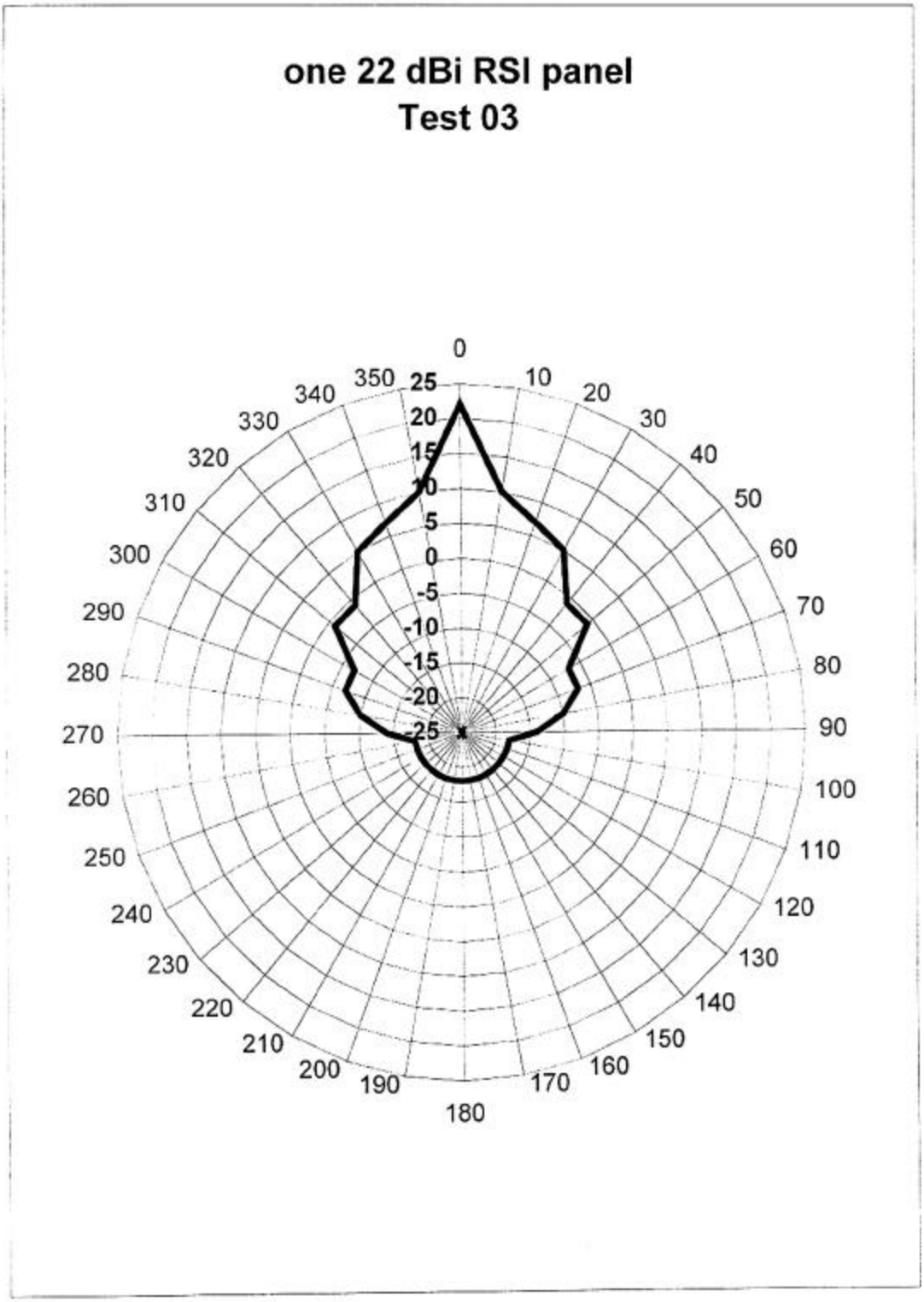
Sheet1 Chart 4

One 22 dBi RSI Panel Antenna

From Vendors Charts

TEST 03

Degree	ANT-PNL-22
0	22
10	10
20	7
30	5
40	-1
50	-1
60	-7
70	-7
80	-10
90	-14
100	-18
110	-18
120	-18
130	-18
140	-18
150	-18
160	-18
170	-18
180	-18
190	-18
200	-18
210	-18
220	-18
230	-18
240	-18
250	-18
260	-18
270	-14
280	-10
290	-7
300	-7
310	-1
320	-1
330	5
340	7
350	10


one 22 dBi RSI panel
Test 03
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
25
20
15
10
5
0
-5
-10
-15
-20
-25

COMSAT RSI
Wireless Antennas

Installation Instructions for Back Mount Assembly #521-556-9-001 2 FT. Patch Array Ant. 2.4 GHz. (A-24A2526N)

Planer Array

1757 S. WINTHROP DR. DES PLAINES, ILLINOIS 60018

I-9730 REV. A

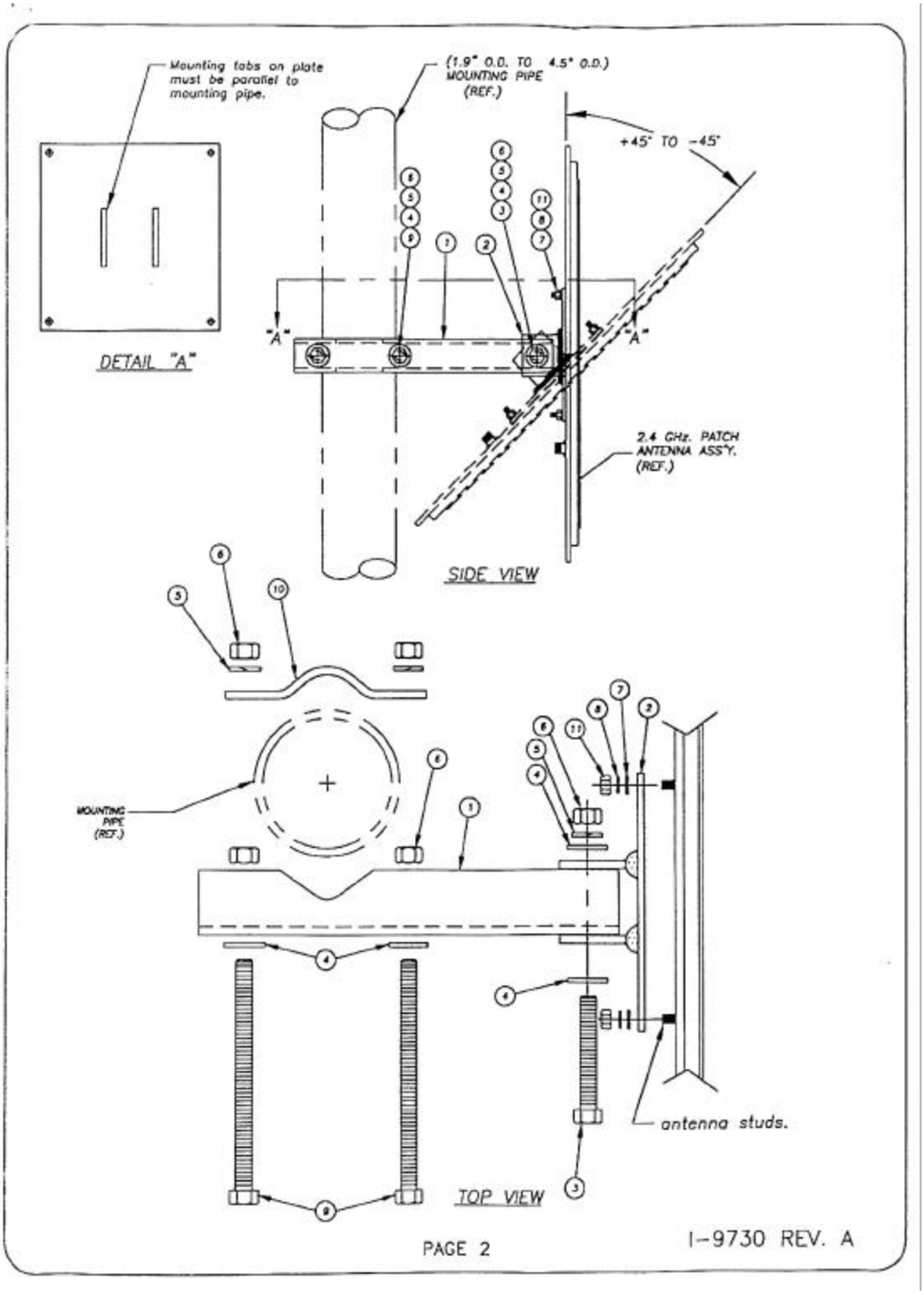
Parts List
For
#521-556-9-001

ITEM	PART NO.	DESCRIPTION	QTY.
1	857-262B9-001	MOUNT SUPPORT BRACKET	1
2	525-562B9-001	MOUNT PLATE ASS'Y.	1
3	666-056-5-602	1/2-13 x 3 1/2" STL. H.H. BOLT (HDG)	1
4	725-088-6-736	1/2" BOLT FLATWASHER (HDG)	4
5	730-102-1-601	1/2" BOLT SPLIT LOCKWASHER (HDG)	3
6	685-228-1-632	1/2-13 HEX NUT (HDG)	5
7	727-044-0-316	1/4" BOLT S.S. FLATWHASHER	4
8	730-104-3-001	1/4" BOLT S.S. SPLIT LOCKWASHER	4
9	666-112-1-602	1/2-13 x7" LG. H.H. FULL THREAD (HDG)	2
10	250-304B9-003	PIPE CLAMP	1
11	680-214-3-814	1/4-20 S.S. HEX NUT	4

To install the A-24A2526 Antenna, determine the polarization that is required. The polarization is determined by facing the desired polarization label up, located on the back of the antenna. To change polarization remove mt. plate, 1/4-20 hardware (items #11, #8 & #7). Once this is determined apply and secure item #2 to the antenna studs and secure tightly with the 1/4-20 hardware (items #7, #8 & #11). Make sure the tabs on the mounting plate are always parallel to mounting pipe. (see Detail "A")
Follow by attaching item #1 to item #2 per drawing.
Secure using 1/2-13 X3 1/2" lg. hardware (item #3, #4, #5 &#6) note that two of item #4 are required. Tighten hardware securely.
Place a set of item #4 to item #9 pass it thru item #1 and secure with a set of item #6.
Once up on tower secure the antenna to the mounting pipe place item #10 making item #9 go thru #10 and secure tightly once the proper location and position is determine.
Note: when tightening all hardware secure it but do not over-tighten.

PAGE 3

I-9730 REV. A


Mounting tabs on plate must be parallel to mounting pipe.
(1.9" O.D. TO 4.5" O.D.) MOUNTING PIPE (REF.)
+45° TO -45°
DETAIL "A"
"A"
"A"
2.4 GHz. PATCH ANTENNA ASS'Y. (REF.)
SIDE VIEW
MOUNTING PIPE (REF.)
antenna studs.
TOP VIEW
PAGE 2
I-9730 REV. A