EXHIBIT 1

COMSAT/RSI has recently been awarded a contract to produce 16 element crossed-dipole array which will operate in a 28 foot radome. This antenna will be used in the ground segment in a communications system developed by ORBCOMM to provide wireless packet data services optimized for short message transfer via satellite links. The space segment will consist of 28 to 36 satellites referred to as ORBCOMM Space Vehicles in polar orbits of about 730 km. These orbits are considered 'low Earth Orbits' making the system a LEO based system (in this case a little LEO based system).

The role of the ground segment is to process message within a specific geographic territory (such as a country or region), and to provide interconnection between the system and the various public and/or private data networks within the territory. The ground segment will consist of a number of ORBCOMM Gateways, to be located strategically throughout the world. The Gateway Earth stations (GES) consists of medium gain tracking antennas, RF and modem equipment, and communications hardware to send and receive packets. The GES are fully redundant and designed for unattended operation. The GES use two (separate) radome-enclosed, VHF antennas which will be supplied by CRSI (see Figure 1). The system is designed to operate in the 137-138 MHz and 148-150.05 MHz frequency bands. The downlink from the satellites to the GES is in the 137-138 MHz band. The transmissions to the satellites occur within the 148-150.05 MHz band with a 50 kHz bandwidth using QPSK modulation. Authority is sought throughout this entire 2.05 MHz band, although authority to operate is particularly important at 149.61 $\pm$ 0.050 MHz to meet ORBCOMM's requirements. The pedestal mounted antennas are capable of full hemispheric coverage and will be designed to operate with the LEO satellites.

Two separate radome enclosed antennas will be installed at the Ashburn, Virginia test site and will be used to verify the system components before shipment of each system to ORBCOMM. The installation will be operated similar to an actual GES in order to check out all of the major subsystem components. For this reason we require operation on at least a single frequency within the 148-150.05 MHz band. Typical communication times to the satellite will be approximately 10 minutes and this time will be a function of the geometry of the position of the satellite relative to the Ashburn, Virginia location. The position of the radomes at the Ashburn site is shown in the attached drawing.

Exhibit 2

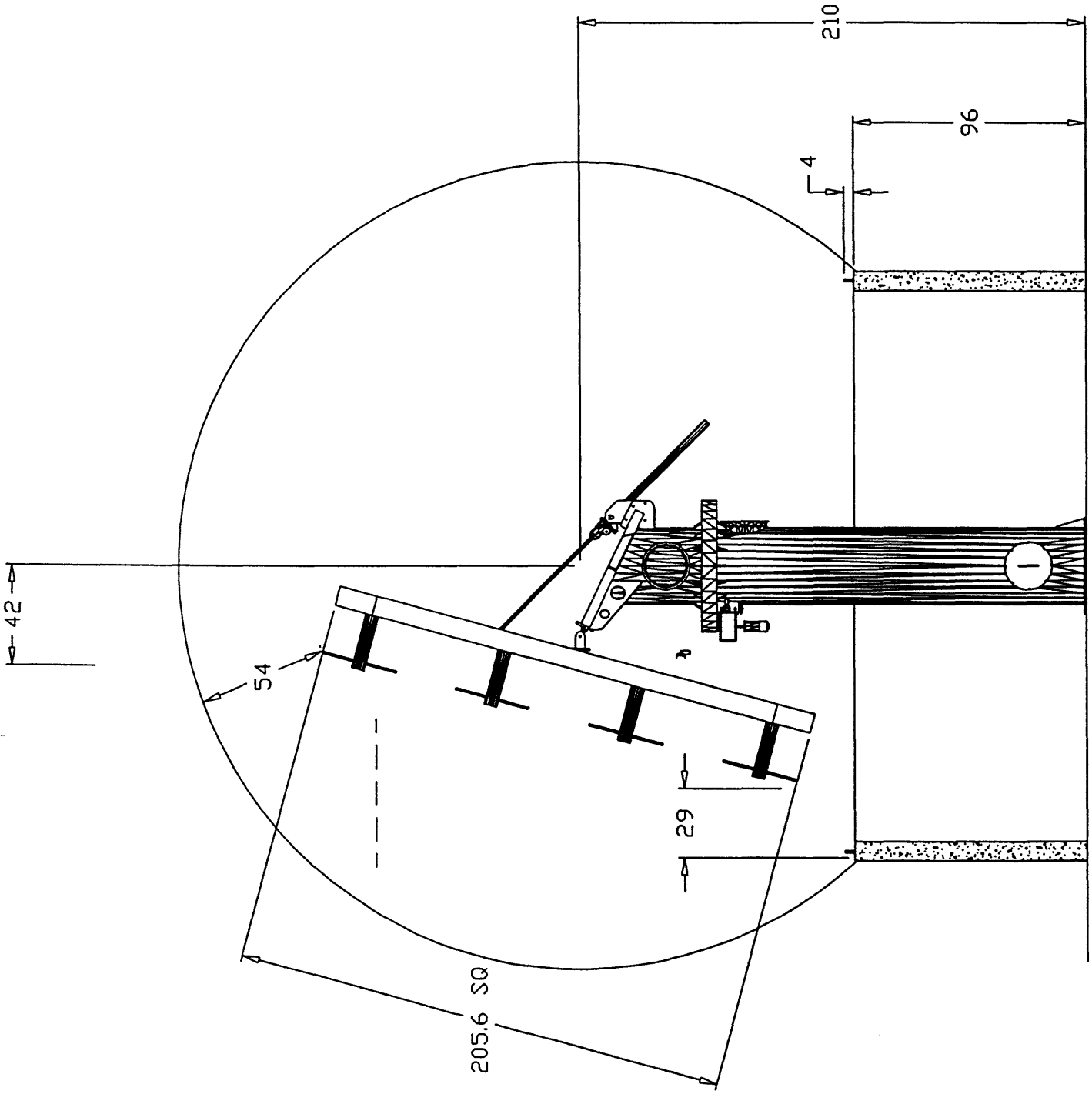


EXHIBIT 3

Radiation Hazard Analysis:

The proposed antenna was analyzed using the Mininec Computer Software program which is a Method of Moments analysis, with 500 watts at the input to the antenna. The power density in miliwatts per square centimeter versus distance from the antenna is shown in the Figure 1. The field strength in volts per meter versus distance from the antenna is shown in Figure 2. The field strength in volts squared per meter squared versus distance from the antenna is shown in Figure 3. The assumption here is that the curves are calculated for the peak gain of the antenna. The levels from the sidelobes will be much less. Since the antenna is capable of full hemispherical coverage, there is a possibility that the mainbeam of the antenna could be pointed at a zero degree elevation angle as referenced to the horizon. However, in practice the antenna will generally be operated at elevation angles of about 10 degrees or more. As a precaution the worst case levels caused by the peak of the beam will be used in the analysis. In addition the 'Controlled Environment' is assumed to be the test range and the 'Uncontrolled Environment' is assumed to be any region outside of the test range. It is well over 200 feet from the proposed ORBCOMM Antenna location to any point outside of the test range property.

During operation no CRSI or other authorized personnel will be closer than 60 feet to the antenna which will meet the requirement for Maximum Permissible Exposure for Controlled Environments. This occurs at approximately 50 feet as can be seen in Figures 1 and 2. For both the Uncontrolled Environment and General Public Exposure the acceptable limits are achieved at approximately 120 feet in Figures 1 and 2 and also Figure 3.

The requirements from FCC 96-326 are as follows:

Power Density Levels (P, mW/cm^2) or Field Strength (V/m or V^2/m^2)	**Requirement/Reference**
61.4 (V/m) or 1.0 (mW/cm^2)	Table 2 Appendix B: FCC 96-326, MAXIMUM PERMISSIBLE EXPOSURE (MPE) : CONTROLLED ENVIRONMENTS
27.5 (V/m) or 0.2 (mW/cm^2)	Table 2 Appendix B: FCC 96-326, MAXIMUM PERMISSIBLE EXPOSURE (MPE) FOR UNCONTROLLED ENVIRONMENTS
800 (V^2/m^2) or 0.2 (mW/cm^2)	Table 3 Appendix B: FCC 96-326, GENERAL PUBLIC EXPOSURE

CERTIFICATION

I hereby certify that I am the technically qualified person responsible for the preparation of the radiation hazard assessment, that I have reviewed this radiation hazard assessment, and that it is complete and accurate to the best of my information, knowledge, and belief.

William N. Klimczak
Manager of Electrical Engineering
COMSAT RSI, Inc.

Dated: December 18, 1996

Figure 1 Power Density versus Distance in feet from ORBCOMM Antenna

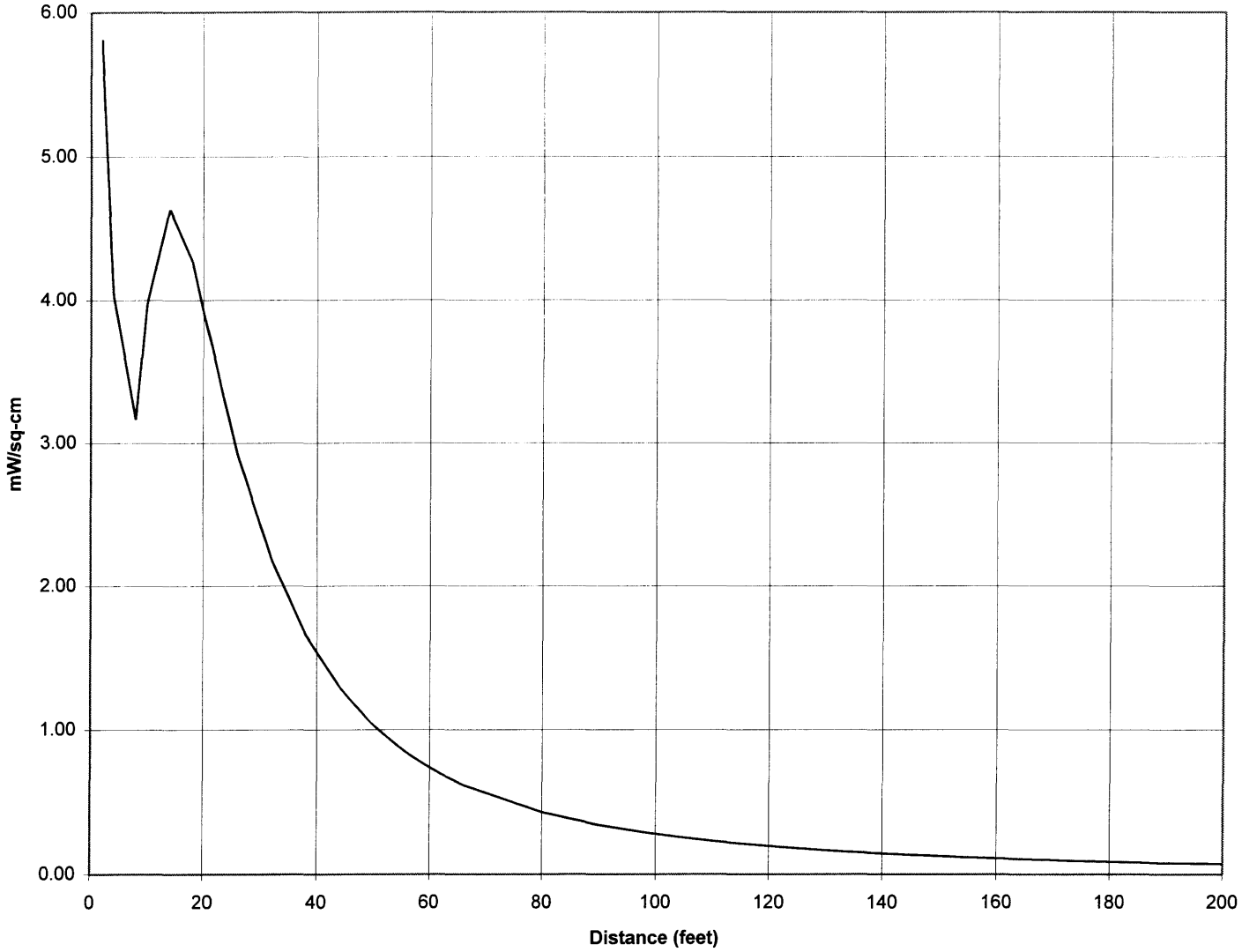


Figure 2 Field Strength versus Distance in feet from ORBCOMM Antenna

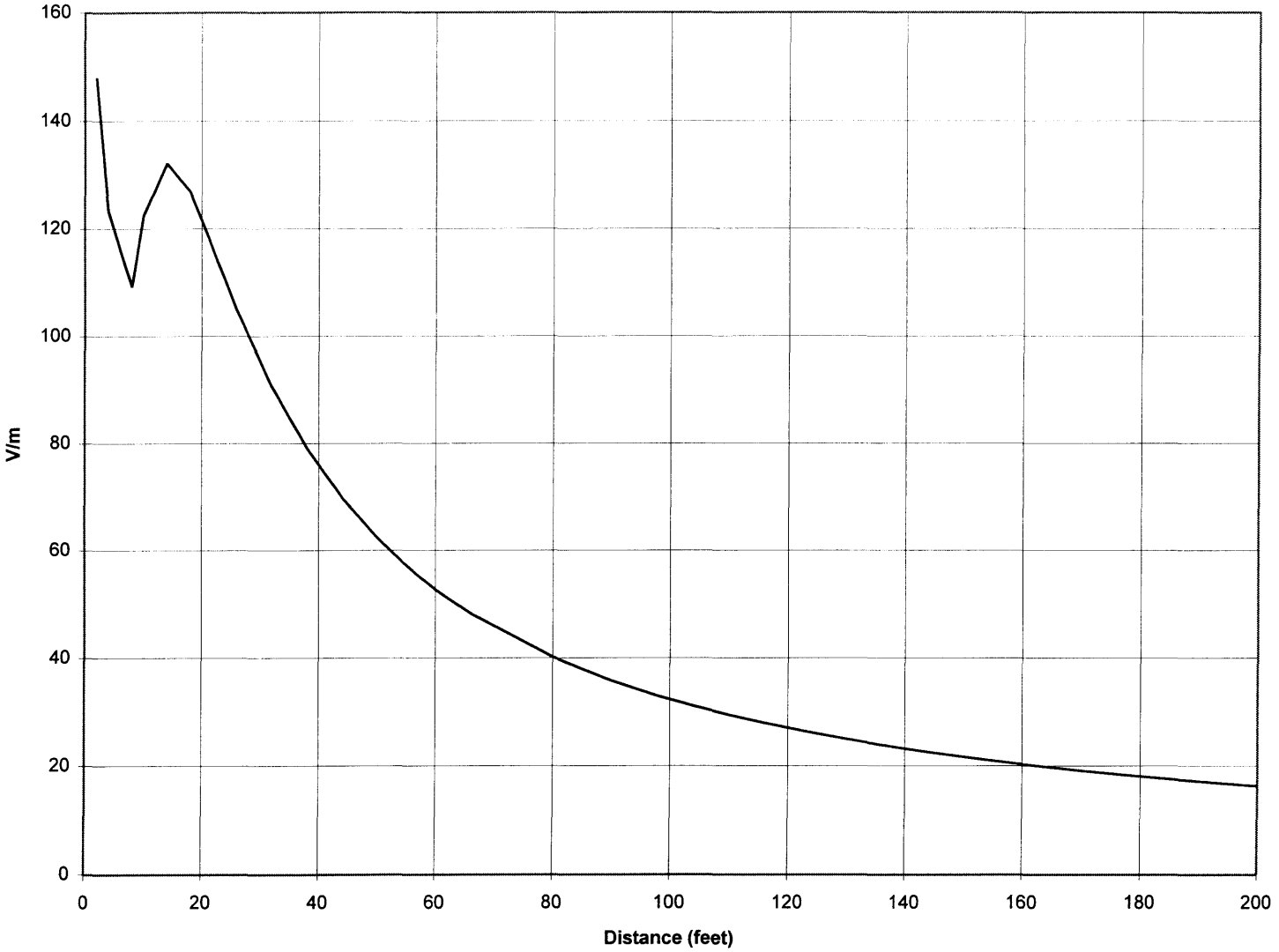
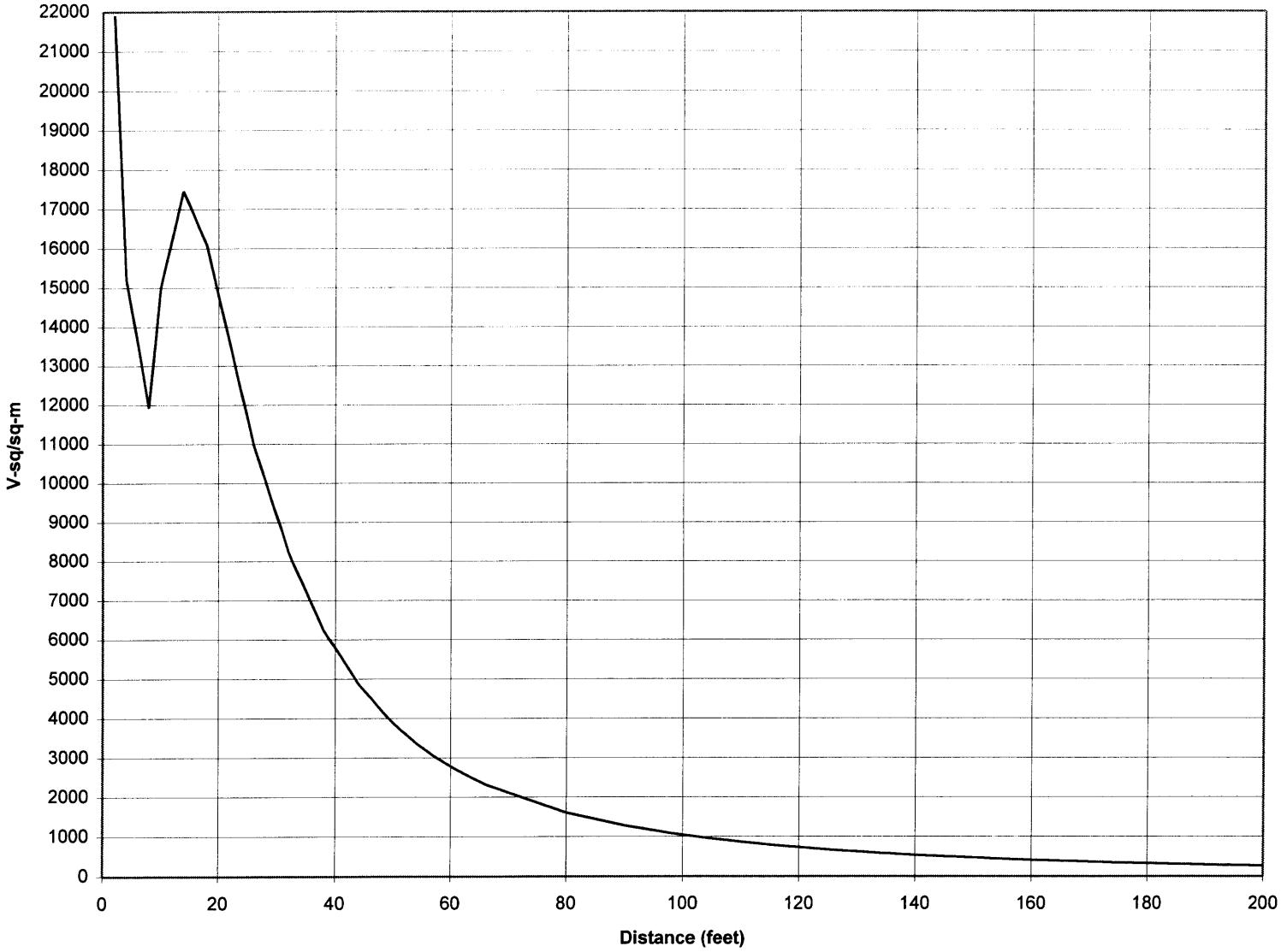
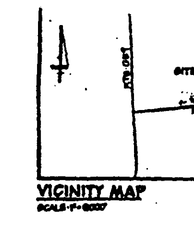


Figure 3 Field Strength versus Distance in feet from ORBCOMM Antenna



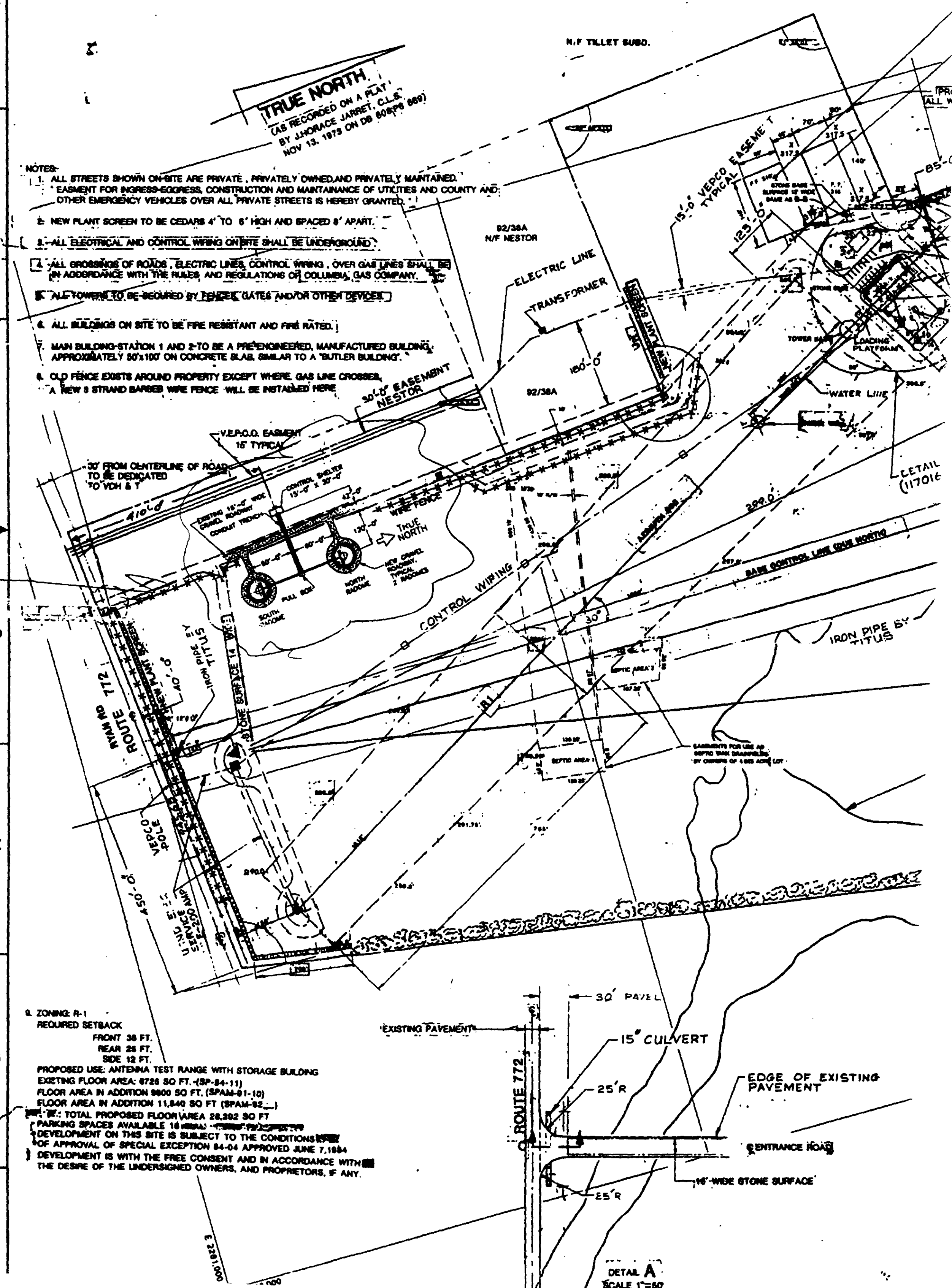
RANGE AND STATION SCHEDULE

RANGE NO.	ITEM	STATION NO.	ITEM
R1	FAA RANGE	STA 1	STORAGE BUILDING
R2	LARGE DIAMETER ANTENNA RANGE	STA 2	OFFICE AREA
R3	MEDIUM DIAMETER RANGE	STA 3	FAA TOWER
R4	SMALL DIAMETER RANGE	STA 4	FAA SOURCE
R5	MODEL TOWER RANGE	STA 5	80 MULTIPLE SOURCE TOWER
R6	FEED RANGE	STA 6	LARGE DIAMETER ANTENNA TOWER
		STA 7	MODEL TOWER
		STA 8	MODEL TOWER SOURCE
		STA 9	FEED TESTING PEDESTAL
		STA 10	FEED SOURCE
		STA 11	SMALL DIAMETER ANTENNA TOWER
		STA 12	MEDIUM DIAMETER ANTENNA TOWER
		STA 13	SATELLITE TRANSMIT FACILITY



NOTES:
1. ALL STREETS SHOWN ON-SITE ARE PRIVATE, PRIVATELY OWNED AND PRIVATELY MAINTAINED. EASMENT FOR INGRESS-EGGRESS, CONSTRUCTION AND MAINTAINANCE OF UTILITIES AND COUNTY AND OTHER EMERGENCY VEHICLES OVER ALL PRIVATE STREETS IS HEREBY GRANTED.
2. NEW PLANT SCREEN TO BE CEDARS 4' TO 6' HIGH AND SPACED 8' APART.
3. ALL ELECTRICAL AND CONTROL WIRING ON SITE SHALL BE UNDERGROUND.
4. ALL CROSSINGS OF ROADS, ELECTRIC LINES, CONTROL WIRING, OVER GAS LINES SHALL BE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF COLUMBIA GAS COMPANY.
5. ALL TOWERS TO BE SECURED BY FENCES, GATES AND/OR OTHER DEVICES.
6. ALL BUILDINGS ON SITE TO BE FIRE RESISTANT AND FIRE RATED.
7. MAIN BUILDING-STATION 1 AND 2-TO BE A PRE-ENGINEERED, MANUFACTURED BUILDING, APPROXIMATELY 50'x100' ON CONCRETE SLAB, SIMILAR TO A "BUTLER BUILDING".
8. OLD FENCE EXISTS AROUND PROPERTY EXCEPT WHERE GAS LINE CROSSES, A NEW 3 STRAND BARBED WIRE FENCE WILL BE INSTALLED HERE.

New Proposed RADOMES



TRUE NORTH
(AS RECORDED ON A PLAT BY J.HORACE JARRET, C.L.S. NOV 13, 1973 ON DB 608 PG 869)
N/F TILLET SUBD.
92/38A
N/F NESTOR
ELECTRIC LINE
TRANSFORMER
15'-0" VEPCO EASEMENT TYPICAL
30'-0" EASEMENT NESTOR
V.E.P.C.O. EASEMENT 15' TYPICAL
30' FROM CENTERLINE OF ROAD TO BE DEDICATED TO VDH & T
410'-0"
160'-0"
CONTROL SHELTER 15'-0" x 30'-0"
WIRE FENCE
TRUE NORTH
NEW PLANT SCREEN
NORTH RADOME
SOUTH RADOME
PULL BOX
CONTROL WIRING
IRON PIPE BY TITUS
STONE SURFACE 14' WIDE
RYAN RD
ROUTE 772
40'-0"
VEPCO POLE
450'-0"
U.N.D. ELEC. SERVICE 200 AMP
TOWER BASE
LOADING PLATFORM
WATER LINE
DETAIL (11701
299.0'
BASE CONTROL LINE (DUE NORTH)
30°
R1
SEPTIC AREA 2
SEPTIC AREA 1
EASEMENTS FOR USE AS SEPTIC TANK DRAINFIELDS BY OWNERS OF 4.665 ACRE LOT
30' PAVEL
15" CULVERT
EXISTING PAVEMENT
25'R
EDGE OF EXISTING PAVEMENT
ENTRANCE ROAD
16' WIDE STONE SURFACE
25'R
DETAIL A
SCALE 1"=50'

9. ZONING: R-1
REQUIRED SETBACK
FRONT 35 FT.
REAR 25 FT.
SIDE 12 FT.
PROPOSED USE: ANTENNA TEST RANGE WITH STORAGE BUILDING
EXISTING FLOOR AREA: 6725 SQ FT. (SP-84-11)
FLOOR AREA IN ADDITION 9600 SQ FT. (SPAM-91-10)
FLOOR AREA IN ADDITION 11,840 SQ FT (SPAM-92-_)
TOTAL PROPOSED FLOOR AREA 28,292 SQ FT
PARKING SPACES AVAILABLE 16
DEVELOPMENT ON THIS SITE IS SUBJECT TO THE CONDITIONS OF APPROVAL OF SPECIAL EXCEPTION 84-04 APPROVED JUNE 7,1984
DEVELOPMENT IS WITH THE FREE CONSENT AND IN ACCORDANCE WITH THE DESIRE OF THE UNDERSIGNED OWNERS, AND PROPRIETORS, IF ANY.

RE: SPECIAL EXCEPTION 84-[illegible], RADIATION SYSTEMS, INC.
THE CONDITIONS OF APPROVAL MAY 7, 1984

The Loudoun County Planning Commission has asked me to officially inform you that, at their April 25, 1984, public hearing, they voted on a motion presented by Mr. [illegible] to recommend approval of the subject application subject to the following conditions:

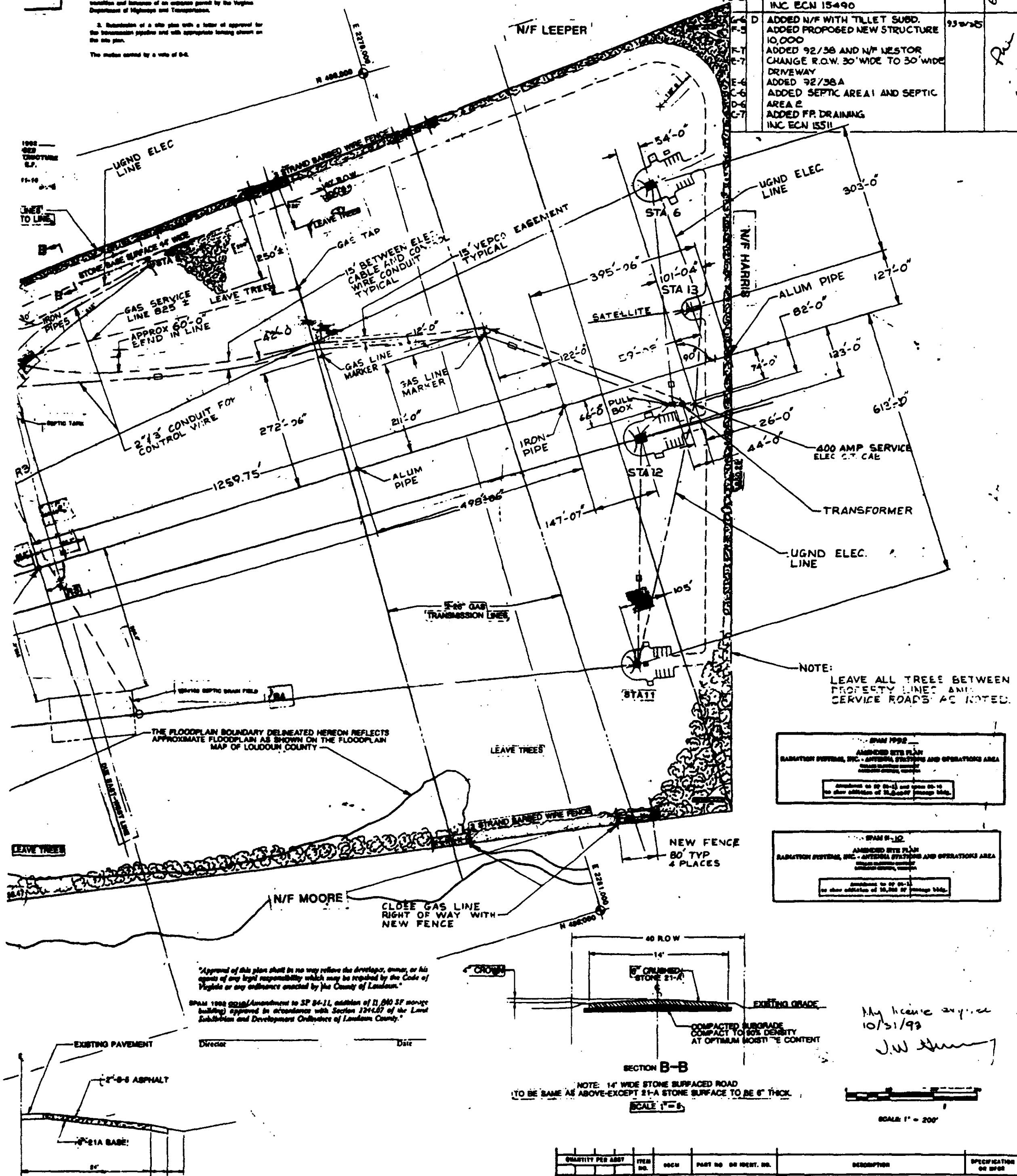
1. That the applicant obtain appropriate approvals from the Health Department

2. Approval of the request for waiver of the [illegible] surface requirements, conditioned upon the [illegible] of a 25-foot paved transition and issuance of an entrance permit by the Virginia Department of Highways and Transportation.

3. Submission of a site plan with a letter of approval for the transmission pipeline and with appropriate fencing shown on the site plan.

The motion carried by a vote of [illegible].

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	MODIFY LOCATION OF SEPTIC TANK AND DRAIN FIELD, RELOCATE VEPCO POLE NO.[illegible]	9 OCT 84	[signature]
F-5 C-1 H-5 B-8	B	ADDED NEW BUILDING WITH DIM ADDED SITE PLAN AMENDMENT ADDED VICINITY MAP ADDED NOTES INC ECN 15434	91.03.25	[signature]
F-5 D-8	C	CHANGE 381 TO 318 ADDED RYAN INC ECN 15490	91-04-22	[signature]
G-6 F-5 F-7 E-7 E-6 C-6 D-6 C-7	D	ADDED N/F WITH TILLET SUBD. ADDED PROPOSED NEW STRUCTURE 10,000 ADDED 92/38 AND N/F NESTOR CHANGE R.O.W. 30' WIDE TO 30' WIDE DRIVEWAY ADDED 92/38A ADDED SEPTIC AREA 1 AND SEPTIC AREA 2 ADDED FP. DRAINING INC ECN 15511	93-[illegible]-25	[signature]



N/F LEEPER
UGND ELEC LINE
3 STRAND BARBED WIRE FENCE
STONE BASE SURFACE 14' WIDE
LEAVE TREES
GAS TAP
250'±
15' BETWEEN ELEC CABLE AND CONTROL WIRE CONDUIT TYPICAL
15' VEPCO EASEMENT TYPICAL
54'-0"
STA 6
303'-0"
N/F HARRIS
395'-06"
101'-04"
STA 13
ALUM PIPE
127'-0"
SATELLITE
82'-0"
IRON PIPES
GAS SERVICE LINE 825'±
APPROX 60'-0" BEND IN LINE
42'-0"
12'-0"
GAS LINE MARKER
122'-0"
59'-0"
90'
74'-0"
123'-0"
2"/3" CONDUIT FOR CONTROL WIRE
272'-06"
211'-0"
66'-8"
PULL BOX
26'-0"
613'-0"
IRON PIPE
44'-0"
400 AMP SERVICE
STA 12
1259.75'
ALUM PIPE
498'-06"
147'-07"
TRANSFORMER
UGND ELEC. LINE
105'
TRANSMISSION LINES
NOTE: LEAVE ALL TREES BETWEEN PROPERTY LINES AND SERVICE ROADS AS NOTED.
STA 11
THE FLOODPLAIN BOUNDARY DELINEATED HEREON REFLECTS APPROXIMATE FLOODPLAIN AS SHOWN ON THE FLOODPLAIN MAP OF LOUDOUN COUNTY
LEAVE TREES
3 STRAND BARBED WIRE FENCE
NEW FENCE 80' TYP 4 PLACES
N/F MOORE
CLOSE GAS LINE RIGHT OF WAY WITH NEW FENCE
E 2279,000
N 486,000
40 R.O.W
14'
6" CRUSHED STONE 21-A
4" CROWN
EXISTING GRADE
COMPACTED SUBGRADE COMPACT TO 90% DENSITY AT OPTIMUM MOISTURE CONTENT
SECTION B-B
NOTE: 14' WIDE STONE SURFACED ROAD TO BE SAME AS ABOVE-EXCEPT 21-A STONE SURFACE TO BE 6" THICK.
SCALE 1"=8
EXISTING PAVEMENT
2"-S-5 ASPHALT
6"-21A BASE
24'
SECTION C-C
SCALE: 1" = 200'

"Approval of this plan shall in no way relieve the developer, owner, or his agents of any legal responsibility which may be required by the Code of Virginia or any ordinance enacted by the County of Loudoun."

SPAM 1993 [illegible] Amendment to SP 84-11, addition of 11,040 SF storage building approved in accordance with Section 1244.07 of the Land Subdivision and Development Ordinance of Loudoun County.

Director ______ Date ______

SPAM 1992 — AMENDED SITE PLAN — RADIATION SYSTEMS, INC. - ANTENNA STATIONS AND OPERATIONS AREA

SPAM 91-10 — AMENDED SITE PLAN — RADIATION SYSTEMS, INC. - ANTENNA STATIONS AND OPERATIONS AREA

My license expires 10/31/93
J.W. [signature]

PARTS LIST

RADIATION SYSTEMS INC.
STERLING, VIRGINIA

LAYOUT DETAILS
ANTENNA STATIONS, OPERATIONS AREA AND BUILDING LOCATIONS-PARKING

SIZE	FSCM NO	
E	19564	117000

SCALE 1"=100' | SHEET 1 OF 3

NEXT ASSY | USED ON
APPLICATION