

**Application for Authority to Construct or Make Changes in an International  
or Experimental Broadcast Station**

(Carefully read instructions before filling out Form—RETURN ONLY FORM TO FCC)

Section I

1. Name of Applicant (See Instruction D)

Street Address (24 characters)

DPA Mac LLC

238 Day Street

City (20 characters)

State

ZIP Code

Telephone No.  
(Include Area Code)

San Francisco

C A

94131

( 415 ) 672-5548

2. Name of person to whom communication should be sent if different from Item 1 above.

Name Trey Hanbury

Street Address 555 13th St. NW

City

State

ZIP Code

Telephone No.  
(Include Area Code)

Washington

D C

20004

( 202 ) 637-5534

3. Purpose of Application (Check appropriate boxes)

(a) Application is for:  New Station  Change in existing authorization

Major

Minor

(b) If this application is for a change in existing facilities, complete Section I plus any other Sections necessary to show all substantial changes in information previously filed with the Commission. Indicate below the Sections completed and filed with this application.

Section II

Section III

Section IV

Section V

Section VG

Section VI

(c) In the space below refer to information already on file with the Commission which, in accordance with Instruction E, may be incorporated in this application by proper reference.

File or Form No. and Date

Section No.

Paragraph No.

4. Requested Facilities

Frequency

Antenna Input Power 2 kW

Hours of Operation 24

Call Sign

(not applicable to international stations)

(if application is for an existing station)

Type of Station:



International



Experimental television



Experimental facsimile



Developmental broadcast station

Location of Main Studio

Street Address

City

State

ZIP Code

47W543 Perry Rd

Maple Park

IL

60151

Section I (page 2)

Application for facilities other than international broadcast stations signify their understanding that:

- (1) All operation upon the frequency requested is for experimental purposes only;
- (2) The frequency requested may not be the best suited to the particular experimental work to be carried on;
- (3) The frequency requested may not be allocated for any service that may be developed as a result of the experimental operation;
- (4) Any frequency which may be assigned is subject to change without prior notice or right to hearing; and
- (5) Any authorization issued pursuant to the application may be modified or withdrawn at any time without prior notice or right to hearing.

The Applicant hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. (See Section 304 of the Communications Act of 1934.)

The Applicant represents that this application is not filed for the purpose of impeding, obstructing, or delaying determination on any other application with which it may be in conflict.

The Applicant acknowledges that all the statements made in this application and attached exhibits are considered material representations, and that all the exhibits are a material part hereof and are incorporated herein as if set out in full in the application.

**Certification**

I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Signed and dated this 28 day of December, 19 2020

**WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND IMPRISONMENT, U.S. CODE, TITLE 18, SECTION 1001.**

Seth Kenvin  
 \_\_\_\_\_  
 (Name of Applicant)  
 BY /s/ Seth Kenvin  
 \_\_\_\_\_  
 (Signature)  
 TITLE President  
 \_\_\_\_\_

**Exhibits furnished as required by this form:**

Exhibit No.	Para. No. of Form	Name of officer or employee (1) by whom or (2) under whose direction exhibit was prepared (show which)	Official Title
Exhibit 1	Section IV.1	Tamir Ostfeld (2)	Consultant
Exhibit 8	Section V	Tamir Ostfeld (2)	Consultant
Exhibit 9	Section V	Tamir Ostfeld (2)	Consultant
Exhibit 10	Section V	Tamir Ostfeld (2)	Consultant
Exhibit 11	Section V	Tamir Ostfeld (2)	Consultant
Exhibit 12	Section V	Tamir Ostfeld (2)	Consultant

Section II

Legal Qualifications	Name of Applicant <u>DPA Mac LLC</u>
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1. Legal identity of applicant (Put "X" in appropriate box)

<input type="checkbox"/> Individual	<input type="checkbox"/> Partnership	<input type="checkbox"/> Corporation
<input type="checkbox"/> Government Entity	<input checked="" type="checkbox"/> Other <u>Limited Liability Company</u>	
<i>(Specify)</i>		

2. If applicant is an individual, is applicant a citizen of the United States?  YES  NO

3. If applicant is a partnership, are all partners citizens of the United States?  YES  NO

4. If applicant is a corporation:

a. Under laws of what state was it organized? Delaware

b. Is more than one-fifth of the capital stock of the corporation owned of record or may it be voted by aliens or their representatives or by a foreign government or representative thereof, or by any corporation organized under the laws of a foreign country?  YES  NO

c. Is any officer or director of the corporation an alien?  YES  NO

If the answer is "yes", give the following for each:

Name	Nationality	Position

d. Is applicant directly or indirectly controlled by any other corporation?  YES  NO  
 If the answer is "yes", give the following for the controlling corporation:

Name	Address	State in which Organized

e. Is more than one-fourth of the capital stock of the controlling corporation either owned of record, or may it be voted by aliens, their representatives, or by a foreign government or representative thereof, or by any corporations organized under the laws of a foreign country?  YES  NO

f. Is any officer or more than one-fourth of the directors of the corporation an alien?  YES  NO

If the answer is "yes", give the name, nationality, and position of each, and give the total number of directors of the corporation:

Name	Nationality	Position	Number of Directors

g. Is the above-described controlling corporation in turn a subsidiary?  YES  NO

If the answer is "yes", attach as EXHIBIT NO. \_\_\_\_\_ additional sheets answering the holding company questions in this paragraph for each company, to and including the organization having ultimate control.

5. a. If applicant is an unincorporated association, give the following:

Total number of members

Number of Alien Members (if any)

b. State the following for alien officers or directors (if any):

<u>Name</u>	<u>Nationality</u>	<u>Position</u>

6. a. What is applicant's principal business?

Broadcast and data services

b. Does applicant or any party to this application have an interest in, or connection with, any AM, FM, or television broadcast station (either domestic or foreign), or any application pending before the Commission?

YES  NO

If Yes, indicate in Exhibit No. \_\_\_\_\_ giving full particulars.

7. Is applicant a representative of an alien or of a foreign government?

YES  NO

If the answer is Yes, explain.

8. a. Has any radio station authorization previously issued to the applicant or party to this application been revoked, either by the Commission or by court order?

YES  NO

b. Has any previous application by the applicant or party to this application been denied by the Commission or by a predecessor agency?

YES  NO

If the answer to (a) and/or (b) is "Yes", explain:

9. a. Has applicant or any party to this application been found guilty by any court of any felony?

YES  NO

b. Has applicant or any party to this application been finally adjudged guilty by a federal court of the violation of the laws of the United States relating to unlawful monopoly, restraint of trade, and/or unfair methods of competition?

YES  NO

If the answer to (a) and/or (b) is "Yes", explain:

**Section III**

Financial Qualifications	Name of applicant DPA Mac LLC	FOR COMMISSIONS USE ONLY File No.
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NOTE: If this application is for a change in an operating facility do not fill out this section.

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
|  | YES                                 | NO                       |
| 1. The applicant certifies that sufficient net liquid assets are on hand or are available from committed sources to construct and operate the requested facilities for three months without revenue.   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. The applicant certifies that:   |                                     |                          |
| (a) it has a reasonable assurance of a present firm intention for each agreement to furnish capital or purchase capital stock by parties to the application, each loan by banks, financial institutions or others, and each purchase of equipment on credit; |                                     |                          |
| (b) it can and will meet all contractual requirements as to collateral, guarantees, and capital investment;  |                                     |                          |
| (c) it has determined that a reasonable assurance exists that all such sources (excluding banks, financial institutions, and equipment manufacturers) have sufficient net liquid assets to meet these commitments.   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Section IV**

**Statement of Program Service of Broadcast Applicant**

- If programs are to be broadcast, attach as Exhibit No. 1 an outline of program plans and policies.
- Research program (not applicable to international stations)

*Attach as Exhibit No. \_\_\_\_\_ a statement outlining in detail the program of research and experimentation proposed and the object or objects thereof including therein a statement that upon authorization the applicant can and will proceed immediately with the proposed program, that the transmission of signals by radio is essential to the proposed program of research and experimentation, that the program of research and experimentation will be conducted by qualified personnel and include as a separate Exhibit No. \_\_\_\_\_ names and qualifications and an estimate of the period of time which will be required to complete the experimental program and terminate operation. If the transmission of broadcast program material is proposed, supply details as to the source of such program material and explicitly the reasons why the data sought cannot be obtained through the use of an unmodulated carrier, pulses, tones, or test pattern. If public participation is proposed to be sought, state the need therefor.*

## Section V

ENGINEERING DATA	NAME OF APPLICANT <b>DPA Mac LLC</b>
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## 1. Purpose of authorization applied for: (Put "X" in appropriate box)

- Construct a new station  
 Modify an existing authorization (Specify)

## 2. Facilities requested

FREQUENCY <sup>1</sup>	POWER <sup>2</sup>	NECESSARY BANDWIDTH (KHZ)	TYPE OF EMISSION <sup>3</sup>
7342-7400KHz	2KW	58	58K0W7D
9400-9458 KHz	2KW	58	58K0W7D
11600-11658 KHz	2KW	58	58K0W7D
12042-12100 KHz	2KW	58	58K0W7D
13570-13628 KHz	2KW	58	58K0W7D
15742-15800 KHz	2KW	58	58K0W7D
17480-17538 KHz	2KW	58	58K0W7D
18962-19020 KHz	2KW	58	58K0W7D

<sup>1</sup> International Broadcast Station applicants need not specify frequency.

<sup>2</sup> For amplitude modulation television (AS), give maximum antenna input power during synchronizing pulses. If particulars are not fully described above, such as aural and visual carrier frequencies and power for television and type of emission, etc., supply this information as Exhibit No. \_\_\_\_\_. Developmental stations using amplitude modulation or frequency modulation, give un-modulated antenna input power. For other types of emission, give a full description of method of determining power as Exhibit No. 8. Describe in Exhibit No. 8 the means which will be used for determining and maintaining power output of the transmitter to the values specified.

<sup>3</sup> See Part 2 of the Commission's Rules and Regulations.

## 3. Proposed transmitter location

STATE	COUNTY	CITY
Illinois	Kane	Maple Park

Number and Street (or other indication of location)

47W543 Perry Rd

Geographic coordinates (to be determined to nearest second) of the proposed antenna structure

NORTH LATITUDE	WEST LONGITUDE
41 50' 35.9"	88 32' 16.7"

4. Attach as Exhibit No. 9 a map(s) (topographic where obtainable, such as U.S. Geological Survey quadrangles) for the area within 15 miles of the proposed transmitter location and show drawn thereon the following data:

1. Proposed transmitter location – accurately plotted.
2. Transmitter location and call signs of all known radio stations (except amateur) and the location of known commercial and government receiving stations within 2 miles of the proposed transmitter location.
  - a. Radio station within 2 miles – None
  - b. Commercial and government receiving stations within 2 miles - None

5. Transmitting apparatus to be installed

MANUFACTURER	TYPE NO.
<ol style="list-style-type: none"> <li>DPA Mac LLC</li> <li>Exodus – power amplifier</li> </ol>	<ol style="list-style-type: none"> <li>Pontoon 2.0 Rev C</li> <li>AMP2056D</li> </ol>
<ol style="list-style-type: none"> <li>ACOM OOD</li> <li>BARRETT radio</li> </ol>	<ol style="list-style-type: none"> <li>2000A</li> <li>Barrett 2050HF – FCC approval - OW4-BARRETT2050HF</li> </ol>

Rated Unmodulated Carrier Power Output  
 AMP2056D – 2000W  
 2000A – 1500W

*(If the above transmitter(s) is/are composite or of a type for which data has not been filed with the F.C.C., attach as EXHIBIT No. 10 a complete technical description of the transmitter(s) and auxiliary equipment with functional (block) diagrams indicating tube complements and the operating constants of the last radio stage. Include also auxiliary radio frequency equipment such as multiplexing networks, sideband filters, etc. If experimental program is likely to make major changes necessary, indicate the tentative arrangement contemplated indicating those portions which are subject to change.)*

6. Transmission line proposed to supply power to the antenna from the transmitter

MAKE Intelics	TYPE NO. C-716J716J-LMR900-50M	DESCRIPTION RF Cable
SIZE IN INCHES (nominal inside transverse dimension)	LENGTH IN FEET	Rated efficiency in percent for this length
7/8 cable	164	0.4-0.5dB to 50m

Make: Andrew

Type No: AVA5-50 Heliax

Desc: 7/8" coax cable

Size: 7/8"

Length: 170' (155' on tower - 5 feet to shelter + 20' in shelter)

Rated Efficiency: 97.5%

(From the AVA5-50 Attenuation tables: At 10 MHz: 0.11 dB/100ft, at 170', it is 0.187 dB.)

**Set Parameters as Desired**

Line Type:	Andrew Heliax LDF5-50A <input type="button" value="v"/>
Line Length:	100 <input type="text"/> <input checked="" type="radio"/> Feet <input type="radio"/> Meters
Frequency:	10 <input type="text"/> MHz
Load SWR:	1 <input type="text"/> : 1
Power In:	1500 <input type="text"/> W
<input type="button" value="Calculate"/>	

**Results**

Matched Loss:	0.112 <input type="text"/> dB
SWR Loss:	0 <input type="text"/> dB
Total Loss:	0.112 <input type="text"/> dB
Power Out:	1461.942 <input type="text"/> W

**1461.942 / 1500 = 97.5% Efficiency)**

7.

**(a) Antenna Structure**

Is the proposed construction in the immediate vicinity or does it serve to modify the construction of an AM broadcast station, FM broadcast station, television broadcast station, or other class of radio station?

If "Yes", attach as Exhibit No. \_\_\_\_\_  Yes  No  
complete engineering data thereon.

Submit as EXHIBIT No. 11 a vertical plan sketch for the proposed total structure (including support buildings, if any) giving heights above ground in feet for all significant features.

Over-all height in feet above ground. (Do not include the height of any obstruction lighting which may be required.) <b>155ft</b>	Over-all height in feet above mean sea level. (Do not include the height of any obstruction lighting which may be required.) <b>954.8ft</b>
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**(b) Antenna Data**

NOTE: Applicants for international broadcasting stations should submit all pertinent data regarding antenna characteristics in accordance with the requirements of the International Telecommunication Union's Radio Regulations.

<b>MAKE</b> 1. STEPPIR 2. M2 3. UB 6-40 Antenna 4. ACOM Antenna	<b>TYPE NO. OR DESCRIPTION</b> 1. HFT542C 2. 10-30LP8 3. UB 4 EL , Yagi 6-40meter 4. LS1210
<b>NUMBER OF SECTIONS</b>	<b>ANTENNA POWER GAIN</b> <b>10-16 dBi (frequency dependent over ground 65 feet)</b>

**(c) During course of experimentation, will antenna system be changed?**

If "Yes", attach as Exhibit No. \_\_\_\_\_  Yes  No  
complete engineering data thereon.

**(d) Is Directional antenna proposed?**

If "Yes", attach as Exhibit No. 12  Yes  No  
complete engineering data thereon.

**8. Frequency or percentage of modulation measurement**

**(a) Method of measuring or monitoring station frequency.**

We use multiple systems to make sure we are aligned on the exact frequency :

1. We calibrate the amplifier to be tune only on the allowed frequency in the license – in case the frequency has been drifted outside the bands–, alarm will be raised.
2. VSWR testing between the antenna and the radio- if the SWR is not aligned the values will be greater than 2.2
3. Monitor w24/7 the TX spectrum with external measuring equipment that is receives independently the signal, while hopping between frequencies each time we change it.

**(b) Method of measuring or monitoring station modulation.**

We have a coupler where we sample the output signal with a low speed ADC demodulate it and monitor the waveform

**9. Environmental Statement, See Part 1, Subpart 1 of the rules.**

Would a Commission grant of your application be a major action as defined by Section 1.1305 of the Commission's rules?

If "Yes", attach as Exhibit No. \_\_\_\_\_  Yes  No  
the required statement in accordance



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with Section 1.1311 of the rules.

**If “No”, explain briefly.**

**DPA-MAC use a transmission system (tower + antenna) that in use for the last 3 years and got all municipal licensing without any rejections from local personal in the county. All protection measures were taken to insure that the transmission system will not harm the surroundings.**

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ANTENNA AND SITE INFORMATION  
*(See instructions B, Section 1)*

NAME OF APPLICANT  
**DPA Mac LLC**

CALL SIGN

CLASS OF STATION

STATION LOCATION

FACILITIES REQUESTED

PURPOSE OF APPLICATION *(Put "X" in appropriate box)*

- a. New antenna construction
- b. Alteration of existing antenna structure
- c. Change in location

LEGAL COUNSEL

**Trey Hanbury, Hogan Lovells US LLP**

ADDRESS

**555 Thirteenth Street, NW, Washington, DC 20004**

CONSULTING ENGINEER

ADDRESS

1. Location of antenna

STATE	COUNTY	CITY OR TOWN
<b>Illinois</b>	<b>Kane</b>	<b>Maple Park</b>

Exact antenna location (*street address*). If outside city limits, give name of nearest town and distance and direction of antenna from the town.

**47W543 Perry Rd**

Geographic coordinates (*to nearest second*). For directional antenna, give coordinates of center of array. For single vertical radiator give tower location.

NORTH LATITUDE	WEST LONGITUDE
<b>41 50' 35.9"</b>	<b>88 32' 16.7"</b>

2. Is the proposed site the same or immediately adjoining the transmitter-antenna site of other stations authorized by the Commission or specified in another application pending before the Commission?

- Yes       No      If yes, give call sign: \_\_\_\_\_

3. Has the FAA been notified of proposed construction? (See Part 17 of FCC Rules)

- Yes       No      If yes, give date and office where notice was filed. \_\_\_\_\_

**4. FEATURES OF SURROUNDING TERRAIN**

Submit as Exhibit No. 9 a chart on which is plotted the exact location of the antenna site, and also the relative location and height of any natural formation or existing man-made structures (*trees, water tanks, towers, buildings, etc.*) which, in the opinion of the applicant, would tend to shield the antenna from aircraft. The chart used shall be a 7.5 or 15 minute series topographic quadrangle (*choice depending upon proximity of the antenna site to landing areas*) or full scale photo copy. On the chart include 1) a scale of miles, 2) sufficient latitude and longitude lines, clearly labeled, so that the location of sites may be verified, and 3) all identifying map information. These charts may be purchased from the U.S. Geological Survey, Washington, D.C. 20242 or, for areas west of the Mississippi River, from the U.S. Geological Survey, Denver, Colorado 80225.

(Exception – Where the proposed antenna site is within the boundary of landing areas, submit a self-made, large scale map showing antenna site runways and existing man-made structures.)

Yes       No      If yes, give date and office where notice was filed. \_\_\_\_\_

**5. List all landing areas within 10 miles of antenna site. Give distance and direction to the nearest boundary of each landing area from the antenna site.**

Landing Area	Distance	Direction
(a) Aurora Municipal Airport	6.3 miles	145.87
(b)		
(c)		

**6. Description of antenna system (If directional, give spacing and orientation of towers).**

Type <b>150ft monopole communication tower</b>						
Description of tower(s)						
Self-supporting		Guyed			Tubular (Pole)	
Tower ( <i>height figures should include obstruction lighting</i> )	#1	#2	#3	#4	#5	#6
Height of radiating elements	105/155ft					
Overall height above ground	155ft					
Overall height above mean sea level	954.8ft					

**7. If a combination of AM, FM, or TV operation is proposed on the same multi-element array (either existing or proposed) submit as Exhibit No. \_\_\_\_\_ a horizontal plan for the proposed antenna system, giving heights of the elements above ground and showing their orientation and spacing in feet. Clearly indicate if any towers are existing.**

**8. Submit as Exhibit No. 11 a vertical plan sketch for the proposed total structure (including supporting buildings, if any) giving heights above ground in feet for all significant features. Clearly indicate existing portions, noting lighting, and distinguish between the skeletal or other main supporting structure and the antenna elements.**

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

12/28/2020 Signature /s/ Tamir Ostfeld  
(date) (check appropriate box below)

Technical Director     Chief Operator     Registered Professional Engineer     Consultant

**Section VI**

**Equal Employment Opportunity Program**

1. Does the applicant propose to employ five or more fulltime employees?

YES  NO

If the answer is Yes, the applicant must include an EEO program called for in the Model EEO Program. (FCC Form 396-A)

# Exhibit 1

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of )  
 )  
Application of DPA Mac LLC for International ) ECFS Inbox 73.702  
Broadcast License )

**PUBLIC INTEREST STATEMENT AND WAIVER REQUEST**

Trey Hanbury  
Tom Peters  
J. Ryan Thompson  
HOGAN LOVELLS US LLP  
555 Thirteenth Street, N.W.  
Washington, DC 20004  
Phone: (202) 637-5663

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**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of )  
 )  
Application of DPA Mac LLC for International ) ECFS Inbox 73.702  
Broadcast License )

**PUBLIC INTEREST STATEMENT AND WAIVER REQUEST**

DPA Mac LLC (DPA Mac) submits this public interest statement and waiver request in support of its application to provide a new, innovative, low-power international high frequency (IHF) broadcasting service that supports data transmissions to foreign destinations. DPA Mac proposes to operate in high frequency (HF) bands governed under Part 73 of the Commission’s rules.

To offer this functionally integrated service, DPA Mac requests waiver of discrete provisions applicable to the requested bands.<sup>1</sup> Consistent with the requirements of Section 1.3 and as demonstrated below, good cause exists to waive the requested rules.<sup>2</sup> The service offering will allow DPA Mac to simultaneously broadcast timely, accurate U.S. financial news internationally from the United States to the general public located in foreign countries while

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<sup>1</sup> See 47 C.F.R. §§ 2.106, 73.701 *et seq.* (rules governing International Broadcast Stations).

<sup>2</sup> 47 C.F.R. § 1.3 (“The provisions of this chapter may be suspended, revoked, amended, or waived for good cause shown, in whole or in part, at any time by the Commission.”); *see also infra* Section II (requesting waiver).



also transmitting data to ensure the continued viability of the IHF broadcast format. DPA Mac aims to democratize financial information by making it easier for foreign investors to acquire and analyze real-time data about major market performance with commercial, off-the-shelf equipment to receive HF, Digital Radio Mondiale (DRM) broadcasts. Providing greater access to timely data and information about the performance of stocks, bonds, derivatives, foreign exchange, and commodities in U.S. exchanges will serve the public interest by promoting investment in businesses operating in the United States.

**I. DPA MAC SATISFIES THE LICENSING REQUIREMENTS, AND ITS PROPOSED INTERNATIONAL BROADCAST SERVICE WILL PROMOTE THE PUBLIC INTEREST BY EFFICIENTLY BROADCASTING ACCURATE U.S. FINANCIAL INFORMATION ABROAD.**

For an applicant to receive a license for an international broadcast station, the Commission requires an applicant to show that: (1) there is a need for the international broadcasting service proposed to be rendered; (2) the necessary program sources are available to the applicant to render the international service proposed; (3) the production of the program service and the technical operation of the proposed station will be conducted by qualified persons; (4) the applicant is legally, technically, and financially qualified and possesses adequate technical facilities to carry forward the service proposed; and (5) the public interest, convenience, and necessity will be served through the operation of the proposed station.<sup>3</sup> As demonstrated below, DPA Mac satisfies these criteria.

**A. DPA MAC'S PROPOSED INTERNATIONAL BROADCASTING SERVICE HAS PROVEN ITS COMMERCIAL VIABILITY AND THUS DEMONSTRATED ITS NEED.**

As part of its licensing requirements for international broadcast stations, the Commission requires an applicant to show “there is a need for the international broadcasting service proposed

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<sup>3</sup> 47 C.F.R. § 73.731(a).

to be rendered.”<sup>4</sup> Such a need exists here. International capital markets rely on U.S. market indices such as the Dow Jones Industrial Average, the S&P 500, and the Nasdaq Composite. The ongoing market volatility associated with the COVID-19 pandemic has reinforced the need for an interconnected public to have timely access to critical market data. To provide international investors with the information they need to promote capital formation and distribution in the United States markets, DPA Mac intends to provide: (1) an over-the-air, commercial-free audio broadcast of U.S. financial news and similar information to populations outside of the United States that have access to a standard, commercial, off-the-shelf HF receiver; and (2) investment data from points within the United States to locations outside the United States carried over a channel immediately adjacent to the HF broadcasts. The proceeds raised from offering the data-service transmissions—which involve a low-power, low-latency digital data transmission service provided to private investors, including small- and medium-sized firms—will provide the necessary financial support to deploy and sustain the HF broadcasting business for the benefit of the public now and into the future.

Through DPA Mac’s corporate partner, 3DB Communications Inc. (3DB), DPA Mac has tested and evaluated its proposed service pursuant to an experimental license for a market trial using spectrum allocated for international broadcast stations.<sup>5</sup> The market trial has allowed DPA Mac to “analyze commercial demand for [its] innovative and improved techniques for

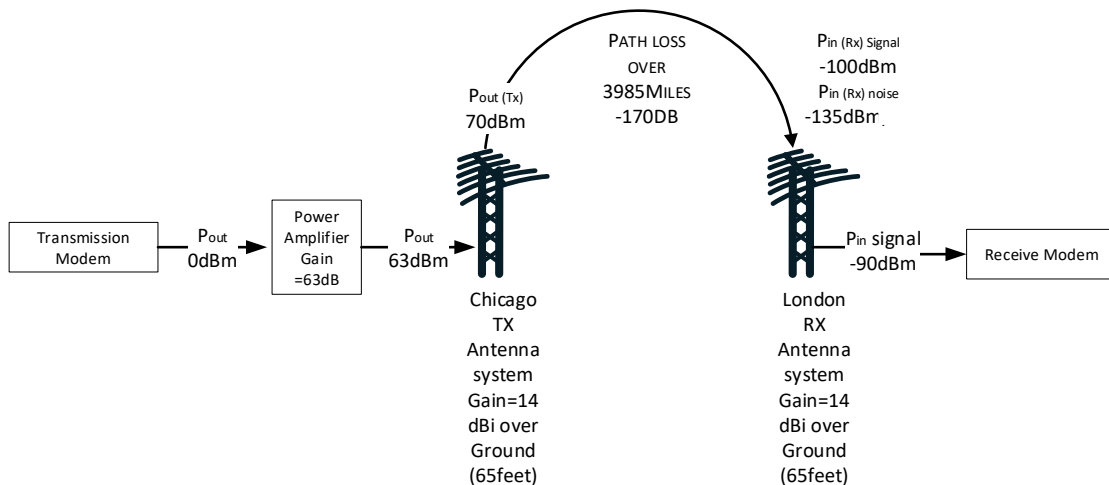
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<sup>4</sup> 47 C.F.R. § 73.731(a)(1).

<sup>5</sup> See Call Sign WI2XXG; see also ELS File No. 0281-EX-CR-2019, Ex. 1, App. A at 4 (granted June 24, 2019) (“3DB will distribute this information over an audio broadcast using HF spectrum allocated for International Broadcast service under Part 73, Subpart 4 of the FCC’s rules”) (“Experimental Application”).

transmitting and receiving HF media.”<sup>6</sup> Positive results from the market trial have encouraged DPA Mac to file an application for an international broadcast license, a natural progression towards commercialization that 3DB foreshadowed in its experimental application.<sup>7</sup> Consequently, positive response to 3DB’s market trial has demonstrated the market demand for and viability of DPA Mac’s proposed services, thus satisfying Section 73.731(a)(1) of the Commission’s rules.

DPA Mac’s system is built from a transmission site with a HF modem, a HF power amplifier, a HF directional antenna, and a monitoring system. In order to receive a transmitted signal in any receive location, the Signal to Noise Ratio (SNR) must meet a minimum threshold in accordance with the modem’s receive sensitivity. The diagram below shows DPA Mac’s high-level solution with details on each component’s contribution. As described below, the system design assures that the SNR level at the receive location (*e.g.*, London) is high enough to meet a standard off-the-shelf DRM receiver (SNR threshold) and guarantees reception quality.



<sup>6</sup> Experimental Application, Ex. 1, App. A at 4 (granted June 24, 2019).

<sup>7</sup> See *id.*, Ex. 1, App. A at 4 (“3DB or a successor company will seek an international broadcast service license for use of the HF spectrum once its market trial and technical analyses are complete.”).

**B. DPA MAC POSSESSES THE NECESSARY PROGRAM SOURCES TO RENDER THE PROPOSED INTERNATIONAL SERVICE.**

To issue an international broadcast station, the Commission also requires that an applicant have access to “the necessary program sources . . . to render the international service proposed.”<sup>8</sup> As described above, DPA Mac proposes to continue offering the services that 3DB has provided pursuant to its experimental application for a market trial.<sup>9</sup> More specifically, DPA Mac will continue broadcasting audio that provides “[t]imely, accurate financial news” while simultaneously sending “supplemental, low latency digital data transmission[s]” to private investors.<sup>10</sup> Accordingly, DPA Mac possesses the necessary program sources to render the proposed international service and therefore satisfies Section 73.731(a)(2).<sup>11</sup>

**C. QUALIFIED PERSONS WILL CONDUCT PROGRAM SERVICE PRODUCTION AND TECHNICAL OPERATION OF THE PROPOSED STATION.**

The Commission also requires applicants for international broadcasting stations to show that “the production of the program service and technical operation of the proposed station will be conducted by qualified persons.”<sup>12</sup> Under its experimental license, 3DB uses trained engineers to operate, monitor, and report the status of transmissions in real time from a dedicated network operations center (NOC). Additionally, 3DB has support engineers onsite at the transmitter’s location to handle technical issues that may arise and a local, dedicated “stop buzzer” contact to immediately cease transmitting if 3DB receives a report of harmful interference. DPA Mac will continue operating under these parameters, which have been proven

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<sup>8</sup> 47 C.F.R. § 73.731(a)(2).

<sup>9</sup> *See supra* Section I.A.

<sup>10</sup> Experimental Application, Ex. 1, App. A at 3-4.

<sup>11</sup> 47 C.F.R. § 73.731(a)(2).

<sup>12</sup> 47 C.F.R. § 73.731(a)(3).

successful for consistent transmissions. More specifically, DPA Mac has contracted Tower Works, Inc. (TWI) to provide on-site operational engineering services. TWI is located close to the Chicago transmission site and will act as the stop buzzer contact, as detailed in 3DB's FCC experimental license.<sup>13</sup> Given the above, DPA Mac therefore will have qualified persons conducting program service production and technical operation of the proposed station, satisfying Section 73.731(a)(3).<sup>14</sup>

**D. DPA MAC IS LEGALLY, TECHNICALLY, AND FINANCIALLY QUALIFIED AND POSSESSES ADEQUATE TECHNICAL FACILITIES TO CARRY FORWARD THE PROPOSED SERVICE.**

The Commission requires an applicant for an international broadcast station to show that it "is legally, technically and financially qualified and possesses adequate technical facilities to carry forward the service proposed."<sup>15</sup> DPA Mac satisfies these conditions.

**1. DPA MAC IS LEGALLY QUALIFIED TO "CARRY FORWARD THE SERVICE PROPOSED."**

Section 310(b) of the Communications Act, as amended, prohibits the following from holding a broadcast license: (1) "any alien or the representative of any alien;" (2) "any corporation organized under the laws of any foreign government;" (3) "any corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country;" or (4) "any corporation directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned

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<sup>13</sup> See Call Sign WI2XXG, Exhibit 2 (identifying stop buzzer contact for transmitter located in Kane County, IL).

<sup>14</sup> 47 C.F.R. § 73.731(a)(3).

<sup>15</sup> 47 C.F.R. § 73.731(a)(4).

of record or voted by aliens, their representatives, or by a foreign government or representative thereof, or by any corporation organized under the laws of a foreign country.”<sup>16</sup> None of the prohibited conditions are present here.

**2. DPA MAC IS TECHNICALLY QUALIFIED AND POSSESSES ADEQUATE TECHNICAL FACILITIES TO “CARRY FORWARD THE SERVICE PROPOSED.”**

Operating pursuant to its experimental license and consistent with its renewal application,<sup>17</sup> 3DB worked diligently to improve its proprietary transmission methods and increase the service’s commercial viability.<sup>18</sup> DPA Mac has benefitted from 3DB’s market trial and refinements. Accordingly, DPA Mac has provided the Commission with a list of transmitting equipment (*e.g.*, transmitter, amplifiers, transmission line, antenna), technical specifications, and technical analyses related to its proposed service that largely complies with 3DB’s granted experimental license.<sup>19</sup>

Other than the rules for which DPA Mac seeks waiver,<sup>20</sup> DPA Mac will comply with the Commission’s Part 73 rules governing the international broadcast service.<sup>21</sup> DPA Mac’s ability and intent to comply with the rules described below further demonstrates that DPA Mac is technically qualified to carry forward the service proposed:

- *Section 73.712 (Equipment Tests)*. DPA Mac will comply with the Commission’s requirements for equipment testing. For any equipment tests conducted during the

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<sup>16</sup> 47 U.S.C. § 310(b).

<sup>17</sup> *See* Experimental Application.

<sup>18</sup> *See* Experimental Application, Ex. 1, App. A at 4 (“3DB needs more time to test these innovations and continue its research and development initiatives to improve its system and finalize the parameters to include in a forthcoming commercial license application.”).

<sup>19</sup> *See* FCC Form 309.

<sup>20</sup> *See infra* Section II.B.

<sup>21</sup> *See* 47 C.F.R. §§ 73.701 *et seq.*

construction of an international broadcasting station, DPA Mac will “use voice identification and test tones only” and not use any programming as part of the test, as established in Section 73.712(a).<sup>22</sup> Additionally, DPA Mac will comply with any notification to “conduct no tests or . . . cancel, suspend, or change the date for the beginning of equipment tests.”<sup>23</sup> DPA Mac will follow the procedures established in Section 73.712(a) for any equipment tests that must “be continued so long as the construction permit . . . remain[s] valid.”<sup>24</sup> Finally, DPA Mac understands and acknowledges that the “authorization for tests embodied in [Section 73.712] shall not be construed as constituting a license to operate but as a necessary part of construction.”<sup>25</sup>

- *Section 73.753 (Antenna Systems)*. The Commission requires international broadcasting stations to “operate with directional antennas.”<sup>26</sup> The directional antennas must “be designed and operated so that the radiated power in the maximum lobe toward the specific zone or area of reception intended to be served shall be at least 10 times the average power from the antenna in the horizontal plane,” and “[r]adiation in all other directions shall be suppressed to the maximum extent technically feasible.”<sup>27</sup> Finally, “[i]n order to eliminate or mitigate harmful interference, the direction of the maximum lobe may be adjusted upon approval of the Commission.”<sup>28</sup> As demonstrated in its technical showing, DPA Mac’s antennas will comply with these requirements.
- *Section 73.758 (System Specifications for Digitally Modulated Emissions in the HF Broadcasting Service)*. The Commission requires digitally modulated emissions to use the DRM standard.<sup>29</sup> Additionally, the licensee must operate under the following parameters: (1) the initial spacing for digitally modulated emissions must be 10 kHz;<sup>30</sup> (2) channels using digitally modulated emissions may share the same spectrum or be interleaved with analog emissions in the same high frequency broadcasting band;<sup>31</sup> (3) a

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<sup>22</sup> 47 C.F.R. § 73.712(a).

<sup>23</sup> 47 C.F.R. § 73.712(b).

<sup>24</sup> 47 C.F.R. § 73.712(c).

<sup>25</sup> 47 C.F.R. § 73.712(d).

<sup>26</sup> 47 C.F.R. § 73.753.

<sup>27</sup> *Id.*

<sup>28</sup> *Id.*

<sup>29</sup> 47 C.F.R. § 73.758(a). DRM is a universal, openly standardized digital broadcasting system for all broadcasting frequencies up to 300 MHz. DRM up to 30 MHz, called “DRM30,” provides large coverage areas and low power consumption and was designed specifically as a high-quality digital replacement for current analog radio broadcasting. *See* DRM Proof of Concept Report at 8.

<sup>30</sup> 47 C.F.R. § 73.758(b)(1).

<sup>31</sup> 47 C.F.R. § 73.758(b)(2).

full, digitally modulated emission will have a 10 kHz bandwidth with its center frequency at any of the 5 kHz center frequency locations in the channel raster currently in use;<sup>32</sup> (4) the frequency tolerance must be 10 Hz;<sup>33</sup> (5) the quality of service may “range from the equivalent of monophonic FM . . . to the low-level performance of a speech codec;”<sup>34</sup> (6) the licensee must use Quadrature Amplitude Modulation (QAM) with orthogonal frequency division multiplexing (OFDM);<sup>35</sup> and (7) the protection ratio values for digital emissions for co-channel and adjacent channel conditions must satisfy the requirements of Resolution 543.<sup>36</sup>

DPA Mac will comply with the applicable parameters. Its spacing for digitally modulated emissions in the applicable frequencies will be 10 kHz, satisfying Section 73.758(b)(1).<sup>37</sup> Its digitally modulated emissions will share the same spectrum, in accordance with the permission granted by Section 73.758(b)(2). For its over-the-air audio broadcast, DPA Mac’s full, digitally modulated emission will have a 10 kHz bandwidth, with center frequency at one of the 5 kHz center frequencies, satisfying Section 73.758(c)(1). Furthermore, it will maintain a frequency tolerance of 10 Hz in accordance with Section 73.758(c)(2). Consistent with the DRM standard, the audio quality is comparable to FM broadcasts, satisfying Section 73.758(c)(3);<sup>38</sup> the broadcast will rely on QAM, satisfying Section 73.758(c)(4); and the RF protection ratio values comply with Resolution 543 (WRC-03), satisfying Section 73.758(c)(5).

- *Section 73.759 (Auxiliary Transmitters)*. The Commission permits the installation of auxiliary transmitters, which “may be installed either at the same location as the main transmitters or at another location.”<sup>39</sup> Consistent with the Commission’s requirements, DPA Mac will maintain auxiliary transmitters “so that they may be put into immediate operation at any time” in order to transmit regular programs: (1) “upon the failure of the main transmitters;” (2) “during maintenance or modification work on the main transmitter, necessitating discontinuance of its operation for a period not to exceed 5

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<sup>32</sup> 47 C.F.R. § 73.758(c)(1).

<sup>33</sup> 47 C.F.R. § 73.758(c)(2).

<sup>34</sup> 47 C.F.R. § 73.758(c)(3).

<sup>35</sup> 47 C.F.R. § 73.758(c)(4).

<sup>36</sup> 47 C.F.R. § 73.758(c)(5).

<sup>37</sup> See DRM Proof of Concept Report at 8 (“DRM30 uses the existing AM broadcast frequency bands and is designed to fit in with the existing AM broadcast band plans based on signals of 9 KHz or 10 KHz bandwidth.”).

<sup>38</sup> See *id.* at 5 (“3DB uses the DRM for AM – DRM30. The ‘DRM30’ modes . . . can deliver FM-comparable sound quality and are specifically designed to utilize the AM broadcast bands below 30 MHz.”).

<sup>39</sup> 47 C.F.R. § 73.759(a).



days;” or (3) “[u]pon request by a duly authorized representative of the Commission.”<sup>40</sup> Additionally, DPA Mac will test the auxiliary transmitters “at least once each week to determine that they are in proper operating condition” and “are adjusted to the proper frequency.”<sup>41</sup> DPA Mac will keep “record . . . of the time and result of each test” and retain such records “for a period of two years.”<sup>42</sup> So that the auxiliary transmitters function properly, DPA Mac will equip the auxiliary transmitters “with satisfactory control equipment which will enable the maintenance of the frequency emitted by the station within the limits prescribed by the regulations in this part.”<sup>43</sup> DPA Mac will ensure that the auxiliary transmitters’ operating power is “not greater than the authorized power of the main transmitters.”<sup>44</sup>

Unfortunately, the COVID-19 pandemic and associated travel restrictions have negatively impacted DPA Mac’s ability to obtain a lease for real estate on which to locate the auxiliary transmitters. DPA Mac is currently examining two possible locations within a four-mile radius of its main location to serve as an auxiliary site. DPA Mac commits to maintaining the required auxiliary transmitters as soon as possible but, given the hardships and delays created by the global pandemic, requests a one year time-limited waiver to comply with 47 C.F.R. § 73.759.<sup>45</sup>

- *Section 73.760 (Alternate Main Transmitters).* An international broadcast station licensee may have an alternate main transmitter if the licensee demonstrates a technical need for an alternate main transmitter and the licensee’s main transmitter and alternate main transmitter: (1) are “located at the same place;” (2) “have the same power rating;” and (3) “meet the construction, installation, operation, and performance requirements of good engineering practice.”<sup>46</sup> DPA Mac’s alternate main transmitter will: (1) be located at the same location as its main transmitter; (2) have the same power rating; and (3) meet the construction, installation, operation, and performance requirements of good engineering practice.
- *Section 73.761 (Modification of Transmission Systems).* The Commission requires specific authority to make the following changes: (1) “replacement of the transmitters as a whole;”<sup>47</sup> or (2) changes “involving an increase or decrease in the power rating of the transmitters,” “in the location of the transmitting antenna,” “in the power delivered to the

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<sup>40</sup> 47 C.F.R. § 73.759(c).

<sup>41</sup> 47 C.F.R. § 73.759(d).

<sup>42</sup> *Id.*

<sup>43</sup> 47 C.F.R. § 73.759(e).

<sup>44</sup> 47 C.F.R. § 73.759(f).

<sup>45</sup> *See infra* Section II.B.3.

<sup>46</sup> 47 C.F.R. § 73.760.

<sup>47</sup> 47 C.F.R. § 73.761(b).

antenna,” “in frequency control or modulation system,” or “in direction or gain of antenna system.”<sup>48</sup> Other changes may be made at any time so long as the Commission is “immediately notified thereof and such changes shall be shown in the next application for renewal of license.”<sup>49</sup> Given the success of 3DB’s market trial pursuant to its experimental license, DPA Mac does not anticipate making any changes to the information listed in its application for an international broadcast station. In the event changes must be made, however, DPA Mac will: (1) seek the Commission’s approval before making any of the changes listed in Sections 73.761(a)-(f); or (2) immediately notify the Commission of changes not covered by Sections 73.761(a)-(f) and show such changes in subsequent applications for an international broadcast station.

- *Section 73.762 (Time of Operation).* The Commission requires all international broadcasting stations to “operate in accordance with the times indicated on their seasonal schedules.”<sup>50</sup> DPA Mac will operate its international broadcast station in accordance with the times indicated on its seasonal schedule.

Where causes beyond a licensee’s control “make it impossible to adhere to the seasonal schedule or to continue operating,” the station: (1) “may limit or discontinue operation for a period of not more than 10 days, without further authority from the FCC;” (2) “immediately” notify the Commission “in writing of such limitation or discontinuance of operation;” and (3) “subsequently” notify the Commission “when the station resumes regular operation.”<sup>51</sup> Where causes beyond a licensee’s control “make it impossible to adhere to the seasonal schedule or to continue operating for a temporary period of more than 10 days,” the station: (1) “may not limit or discontinue operation until it requests and receives specific authority to do so from the FCC;” and (2) must notify the Commission when it “subsequently resumes regular operation.”<sup>52</sup> While DPA Mac has taken measures to reduce the risk of interrupted operations (*e.g.*, site location, equipment selection), DPA Mac will comply with the Commission’s notification requirements if unforeseen events render operation impossible.

- *Sections 73.781 (Logs) and 73.782 (Retention of Logs).* The Commission requires a licensee to “maintain the station log” by making an entry that: (1) lists “the time each station identification announcement (call letters and location) is made;” (2) “briefly describ[es] each program broadcast” (*e.g.*, “music,” “drama,” “speech”) and includes “the name or title thereof, language, and the sponsor’s name, with the time of the beginning and ending of the complete program;” and (3) shows “the name of the network

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<sup>48</sup> 47 C.F.R. §§ 73.761(a), (c)-(f).

<sup>49</sup> 47 C.F.R. § 73.761.

<sup>50</sup> 47 C.F.R. § 73.762(a).

<sup>51</sup> 47 C.F.R. § 73.762(b).

<sup>52</sup> 47 C.F.R. § 73.762(c).

originating the program,” if the program came from a network.<sup>53</sup> Additionally, a licensee must generally retain its log “for a period of two years.”<sup>54</sup> For logs “involving communications incident to a disaster or which include communications incident to or involved in an investigation by the Commission,” the licensee must retain the logs “until [it] is specifically authorized in writing by the Commission to destroy them.”<sup>55</sup> Finally, a licensee must retain logs “incident to or involved in any claim or complaint of which the licensee . . . has notice . . . until such claim or complaint has been fully satisfied or until the same has been barred by [the] statute [of limitations].”<sup>56</sup> DPA Mac will maintain and retain a station log consistent with the Commission’s recordkeeping requirements.

- *Section 73.787 (Station Identification)*. An international broadcast station licensee must “make station identification announcement[s] (call letters and location) . . . at the beginning and ending of each time of operation and during the operation on the hour.”<sup>57</sup> Furthermore, “[s]tation identification, program announcements, and oral continuity shall be made with international significance (language particularly) which is designed for the foreign country or countries for which the service is primarily intended.”<sup>58</sup> DPA Mac will comply with the Commission’s station identification requirements.

Accordingly, 3DB’s record of providing service pursuant to the experimental license, DPA Mac’s willingness to comply with all applicable Part 73 rules for which it does not seek waiver, and DPA Mac’s attached technical showing demonstrate that DPA Mac is technically qualified to provide the proposed service, as required by Section 73.731(a)(4).

### **3. DPA MAC WILL OPERATE IN PART 73 FREQUENCIES.**

DPA Mac seeks authorization to transmit in the following Part 73 frequencies:

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<sup>53</sup> 47 C.F.R. § 73.781.

<sup>54</sup> 47 C.F.R. § 73.782.

<sup>55</sup> *Id.*

<sup>56</sup> *Id.*

<sup>57</sup> 47 C.F.R. § 73.787(a).

<sup>58</sup> 47 C.F.R. § 73.787(b).

	<b>Part 73 Frequencies (MHz)</b>	<b>BW (kHz)</b>
1.	7.342-7.400	58
2.	9.400-9.458	58
3.	11.600-11.658	58
4.	12.042-12.100	58
5.	13.570-13.628	58
6.	15.742-15.800	58
7.	17.480-17.538	58
8.	18.962-19.020	58

DPA Mac's highly directional antennas operating at only 2000 Watts greatly limit the potential to cause harmful interference to other Part 73 licensees.

**4. DPA MAC IS FINANCIALLY QUALIFIED TO “CARRY FORWARD THE SERVICE PROPOSED.”**

Since 2017, 3DB has provided the service pursuant to its experimental license as part of a market trial, using its own equipment. Moving forward and pursuant to this application, DPA Mac will serve as licensee, as contemplated in 3DB’s most recent renewal application.<sup>59</sup> The market trials have demonstrated the economic viability of the proposed service, which will allow DPA Mac to finance its commercial-free audio broadcast with revenues earned from providing its “low latency digital data transmission service” to “investment and commercial banks, proprietary trading companies[,] and security exchanges, among others.”<sup>60</sup>

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<sup>59</sup> See Experimental Application, Ex. 1, App. A at 4 (“3DB or a successor company intends to pursue . . . a permanent, commercial license using the international HF bands.”).

<sup>60</sup> *Id.*

Given the above, DPA Mac is legally, technically, and financially qualified and possesses adequate technical facilities to provide the proposed service. The criteria of Section 73.731(a)(4) is satisfied.<sup>61</sup>

**E. OPERATION OF THE PROPOSED STATION WILL SERVE THE PUBLIC INTEREST, CONVENIENCE, AND NECESSITY.**

Finally, the Commission requires that an applicant show “the public interest, convenience and necessity will be served through the operation of the proposed station.”<sup>62</sup> DPA Mac clearly satisfies this condition. In 2003, the FCC reallocated HF bands from fixed and mobile services to the broadcasting service because the bands’ “long-range propagation characteristics . . . enable audio programs to be received directly by the general public in countries far from the country of origin.”<sup>63</sup> This capability allows international broadcast services to “promote [the] national interest around the world.”<sup>64</sup>

DPA Mac’s proposed service will promote the national interest globally. By providing timely, accurate U.S. financial news around the world in the form of a commercial-free public broadcast, DPA Mac will be promoting the “simple and straightforward concept” that underlies the mission of the U.S. Securities and Exchange Commission (SEC) and the securities laws of this country: “all investors, whether large institutions or private individuals, should have access

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<sup>61</sup> 47 C.F.R. § 73.731(a)(4).

<sup>62</sup> 47 C.F.R. § 73.731(a)(5).

<sup>63</sup> *Amendment of Parts 2, 73, 74, 80, 90, and 97 of the Commission’s Rules to Implement Decisions from World Radiocommunication Conferences Concerning Frequency Bands Below 28000 kHz*, Report and Order, 18 FCC Rcd 3423, ¶ 2 (2003) (“HFBC Order”).

<sup>64</sup> *Id.* ¶ 11.

to certain basic facts about an investment prior to buying it, and so long as they hold it.”<sup>65</sup>

Additionally, DPA Mac’s proposed service will satisfy global demand for timely, accurate U.S. financial news, which 3DB’s successful market trial experiments have demonstrated exists. By broadcasting U.S. financial news, DPA Mac will be promoting global interest in U.S. companies and investment in the U.S. economy. By improving the delivery of U.S. financial market information across the globe and promoting international competition, DPA Mac’s proposed service will fulfill the objectives of Section 73.788(a).<sup>66</sup> Finally, DPA Mac’s ability to efficiently broadcast this information using lower power: (1) maximizes use of this spectrum by allowing DPA Mac to transmit data using PLMR spectrum that would otherwise lie fallow due to adjacent-channel rolloff from typical IHF facilities operating higher power; and (2) reduces the threat of interference to other users of the spectrum. For the above reasons, grant of DPA Mac’s

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<sup>65</sup> Securities and Exchange Commission, *What We Do*, <https://bit.ly/2phvq9i> (last visited Mar. 5, 2020); *see also* Kara M. Stein, Comm’r, Sec. & Exch. Comm’n, Address at the Council of Institutional Investors 2018 Fall Conference: Improving Information for Investors in the Digital Age (Oct. 23, 2018), <https://bit.ly/2O3Qjh1> (last visited Mar. 5, 2020) (“No matter the means of communication, timely, relevant, and reliable information has always been critical to the success of the American capital markets.”).

<sup>66</sup> *See* 47 C.F.R. § 73.788(a) (requiring an international broadcast service to “reflect the culture of this country” and “promote international goodwill, understanding, and cooperation”). Furthermore, DPA Mac will comply with Sections 73.788(c) and 73.703. *See* 47 C.F.R. §§ 73.703 (showing the map that labels the “zones . . . of reception to be served by international broadcasting stations”), 73.788(c) (“The geographic areas to be served by international broadcasting stations are the zones and areas of reception shown in § 73.703.”). Sections 73.788(b) and (d) are inapplicable for DPA Mac’s proposed service, given that DPA Mac will not be broadcasting commercials or sponsored programs or transmitting the program of an AM broadcast station. *See* 47 C.F.R. §§ 73.788(b) (listing requirements for an international broadcast service to transmit “commercial or sponsored programs”), 73.788(c) (listing conditions under which “[a]n international broadcast station may transmit the program of a[n] AM broadcast station or network system”).

application therefore will serve the public interest, convenience, and necessity and comply with Section 73.731(a)(5).<sup>67</sup>

## **II. DPA MAC REQUESTS WAIVER OF SECTION 2.106 AND CERTAIN PART 73 RULES THAT, IF APPLIED, WOULD PREVENT DPA MAC FROM PROVIDING ITS INNOVATIVE, FUNCTIONALLY INTEGRATED SERVICE.**

DPA Mac seeks waiver of Section 2.106 and certain provisions in Part 73 of the Commission’s rules. The Commission may grant requests for a waiver under Section 1.3 of its rules if the petitioner demonstrates good cause.<sup>68</sup> Good cause exists “where particular facts would make strict compliance inconsistent with the public interest.”<sup>69</sup> “To make this public interest determination, the waiver cannot undermine the purpose of the rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.”<sup>70</sup> In DPA Mac’s case, strict compliance with Section 2.106 and certain Part 73 rules would be inconsistent with the public interest. DPA Mac’s proposed operations will benefit American financial markets and foreign investors interested in investing in American markets by increasing international access to real-time data about American market performance. Furthermore, international capital markets rely on U.S. market news, so DPA Mac’s proposed operations will

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<sup>67</sup> 47 C.F.R. § 73.731(a)(5).

<sup>68</sup> See 47 C.F.R. § 1.3 (“The provisions of this chapter may be . . . waived for good cause shown.”).

<sup>69</sup> *ICO Global Communications (Holdings) Ltd. v. FCC*, 428 F.3d 264, 269 (D.C. Cir. 2005) (citing *NE Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990)).

<sup>70</sup> *Kyma Medical Technologies Ltd. Request for Waiver of Part 15 of the Commission’s Rules Applicable to Ultra-Wideband Devices*, Order, 31 FCC Rcd 9705, ¶ 5 (2016) (citing *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969)) (“*Kyma Waiver Order*”).

benefit American businesses and foreign investors by reducing costs associated with acquiring timely, accurate market data.<sup>71</sup>

**A. SECTION 2.106, US136**

In order to use the 7.3-7.4 MHz band,<sup>72</sup> DPA Mac requests waiver of Section 2.106, US136(b)(2).<sup>73</sup> In the Table of Allocations, US136(b)(2) restricts use of 7.3-7.4 MHz band to “stations in the FS, land mobile service (LMS), and maritime mobile service (MMS) that were licensed prior to March 25, 2007, except that, in the sub-band 7.35-7.4 MHz, use is restricted to stations that were licensed prior to March 29, 2009.”<sup>74</sup>

When “analyzing requests for non-conforming spectrum uses, the Commission has indicated it would generally grant such waivers ‘when there is little potential for interference into any service authorized under the Table of Frequency Allocations and when the non-conforming operator accepts any interference from authorized services.’”<sup>75</sup> The Commission has also waived Section 2.106 when “the underlying purpose of the rules would not be served by [their] application . . . and that grant of the waiver is in the public interest.”<sup>76</sup>

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<sup>71</sup> See *Request by LoJack Corporation for a Partial Waiver of Section 90.20(e)(6) and Part 2 of the Commission’s Rules*, Declaratory Ruling and Order, 26 FCC Rcd 12991, ¶ 15 (2011) (granting waiver of Section 2.106 because applicant’s operations would increase access to wireless services for customers previously unable to acquire such services).

<sup>72</sup> See *supra* Section I.D.3.

<sup>73</sup> 47 C.F.R. § 2.106, US136(b)(2).

<sup>74</sup> *Id.*

<sup>75</sup> *Applications of Northrop Grumman Space & Mission Systems Corporation for Authority to Operate a Global Satellite System Employing Geostationary Satellite Orbit and Non-Geostationary Satellite Orbit Satellites in the Fixed-Satellite Service in the Ka-band and V-band*, Order and Authorization, 24 FCC Rcd 2330, ¶ 74 (2009) (citing *Fugro-Chance, Inc.*, Order and Authorization, 10 FCC Rcd 2860, ¶ 2 (1995)).

<sup>76</sup> *Mobile Relay Associates Requests for Waivers to Permit Part 90 Use of Channels on the Band Edges Between Part 90 and Part 95 Spectrum*, Order, 29 FCC Rcd 660, ¶ 6 (2014).



Good cause exists for waiving Section 2.106, US136. Operating pursuant to its experiment license and with zero complaints from other spectrum users, 3DB has shown that the broadcast service – which transmits from a single location – creates little potential for harmful interference to other services. In the event of any interference, DPA Mac agrees to accept interference from authorized services in the 7.3-7.4 MHz band. Furthermore, waiver will allow DPA Mac to democratize the dissemination of financial information by making it easier for foreign investors to acquire and analyze real-time data about major market performance with commercial, off-the-shelf equipment to receive HF, Digital Radio Mondiale (DRM) broadcasts. Providing greater access to timely data and information about the performance of stocks, bonds, derivatives, foreign exchange, and commodities in U.S. exchanges will serve the public interest by promoting investment in businesses operating in the United States.

**B. PART 73, SUBPART F RULES (INTERNATIONAL BROADCAST STATIONS)**

**1. SECTION 73.702**

DPA Mac requests waiver of two subsections of Section 73.702, which govern the assignment and use of frequencies for IHF. DPA Mac requests waiver of Sections 73.702(j)<sup>77</sup> and 73.702(m).<sup>78</sup> Good cause exists for waiving each subsection because, given the small amounts of spectrum at issue in DPA Mac’s request, waiver will: (1) not undermine the rule’s purpose; and (2) allow DPA Mac to provide its innovative, functionally integrated service, the public interest benefits of which are significant.<sup>79</sup>

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<sup>77</sup> 47 C.F.R. § 73.702(j).

<sup>78</sup> 47 C.F.R. § 73.702(m).

<sup>79</sup> *See supra* Section I.

*Section 73.702(j).* Section 73.702(j) limits the assignment of frequencies to only one frequency “at any one time for any one program transmission except in instances where a program is intended for reception in more than one zone or area of reception and the intended zones or areas cannot be served by a single frequency.”<sup>80</sup> Good cause exists for also waiving this provision. DPA Mac reduces the risk of interference to other users and increases spectral efficiency by operating at much lower power than traditional international high frequency broadcast operators do. At the same time, DPA Mac’s lower power transmissions are more susceptible to disruption from atmospheric changes and other source of interference than traditional high-power transmissions are. To overcome these challenges without raising power, DPA Mac may need to use more than one frequency at any given time to maintain a continuous, uninterrupted connection to listeners. Waiver will promote the public interest in reducing the potential for interference and increasing spectral efficiency.

*Section 73.702(m).* To the extent applicable, DPA Mac requests waiver of Section 73.702(m), which limits the frequency-hours of all licensees to 100 per day.<sup>81</sup> As with the other subsections in Section 73.702 discussed above, good cause exists for waiving this provision. 3DB’s operations pursuant to its experimental license have received no complaints of harmful interference, demonstrating that DPA Mac’s innovative, functionally integrated service can operate efficiently at low power in small amounts spectrum allocated to IHF broadcasting, thus minimizing the threat of harmful interference. DPA Mac notes that, because the rule’s applicability depends on the number of international broadcasting stations in operation during a

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<sup>80</sup> 47 C.F.R. § 73.702(j).

<sup>81</sup> 47 C.F.R. § 73.702(m).

given day, which is uncertain, the provision's applicability is also uncertain. Therefore, out of an abundance of caution, DPA Mac requests waiver.

## **2. SECTION 73.751(C)**

DPA Mac requests waiver of the minimum power requirement in Section 73.751(c). Good cause exists for granting DPA Mac's waiver request. Technological advances have rendered a minimum power requirement obsolete, and DPA Mac's technological showing demonstrates that it can successfully operate at a much lower power of 2 kW. Operating at this lower power will increase the efficiency of transmissions and reduce the likelihood of harmful interference to adjacent band operations, allowing DPA Mac to maximize use of this spectrum.

## **3. TIME-LIMITED WAIVER OF SECTION 73.759**

DPA Mac requests a time-limited waiver of the requirements of Section 73.759 for twelve months. Due to the social and economic effects of COVID-19, DPA Mac is unable to immediately comply with the auxiliary transmitters requirement of Section 73.759. DPA Mac was unable to secure the necessary real estate for the auxiliary transmitters but anticipates finalizing such arrangements within one year.

Good cause exists to temporarily waive Section 73.759 for three reasons. First, COVID-19 has created difficult circumstances beyond DPA Mac's control. The FCC has already recognized the impact of COVID-19 and has taken remedial action to mitigate its effects on the public and telecommunications businesses.<sup>82</sup> Moreover, the FCC has found the circumstances of

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<sup>82</sup> See *Guidance for Stations in Phase 9 of Post-incentive Auction Transition as a Result of the Novel Coronavirus (COVID-19) Pandemic*, Public Notice, DA 20-282, at 1 (rel. March 17, 2020) (temporarily waiving Phase 9 stations' transition deadline due to "circumstances related to the COVID-19 pandemic" that were "outside of a station's control").

COVID-19 constitute good cause to waive certain rules.<sup>83</sup> There is a stronger public interest benefit in allowing DPA Mac’s programming to begin than in applying Section 73.759 – especially in the middle of an economic downturn caused by COVID-19. There is no public interest benefit in delaying the programming and potential investment in American business particularly because DPA Mac is actively working toward complying within the next year. Second, because DPA Mac anticipates securing the necessary real estate and installing auxiliary transmitters within a year, a time-limited waiver does not undermine the purpose of the rule. Third, and finally, DPA Mac’s strict compliance with Section 73.759 would be inconsistent with the public interest given its current ability to provide its informative and beneficial financial market programming. DPA Mac is immediately able to broadcast its programming to the foreign public using its main transmitter. Auxiliary transmitters provide a back-up means of transmission but are only necessary in rare circumstances.

### **III. CONCLUSION**

As demonstrated above, DPA Mac satisfies the licensing requirements for an international broadcast station. Waiver of Section 2.106 and the Part 73 provisions described above is necessary to permit the operation of DPA Mac’s innovative international broadcast station service. Granting waiver will promote the public interest by enabling the efficient broadcasting of accurate U.S. financial information abroad. DPA Mac’s corporate partner has proven the service’s viability and market demand pursuant to its experimental license.

Accordingly, DPA Mac has taken measures to ensure that operations will not cause harmful

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<sup>83</sup> See *Waiver of FCC Rule Sections 1.946(c) and (d) for Wireless Site-based and Mobile-only System*, Order, DA 20-414 (WTB/PSHSB rel. April 15, 2020) (“[W]e find that COVID-19 presents unique and unusual circumstances sufficient to support our grant of a waiver providing additional [time for deadlines].”).

interference to PLMR, Maritime service, Aviation, or ISM equipment operations. Therefore, waiver and grant of DPA Mac's application will serve the public interest, convenience, and necessity.

Respectfully submitted,

/s/ Trey Hanbury

Trey Hanbury

Tom Peters

J. Ryan Thompson

HOGAN LOVELLS US LLP

555 Thirteenth Street, N.W.

Washington, DC 20004

Phone: (202) 637-5663

## Exhibit 8

### **un-modulated antenna input power. :**

1. Antenna input power: 2KW
2. Antenna minimal gain: 10dBi
3. EIRP is: 22KW

### **Description of how we determine the power:**

1. We have a bi directional coupler at the first stage where we measure the output power by sampling it with a low speed ADC (power envelop detection mechanism).
2. We use the same route to detect VSWR of the antenna to make sure we keep the values below 1.5
3. At the power stage (amplifier / radio) we monitor the input power and the output power by using built in ALC circuitry inside the amplifier and by reading the corresponded values inside the amplifier.
4. We use monitoring system at the antenna input to make sure the input power is 2KW at the antenna port

# Exhibit 9 - MAPS

## Proposed transmitter location

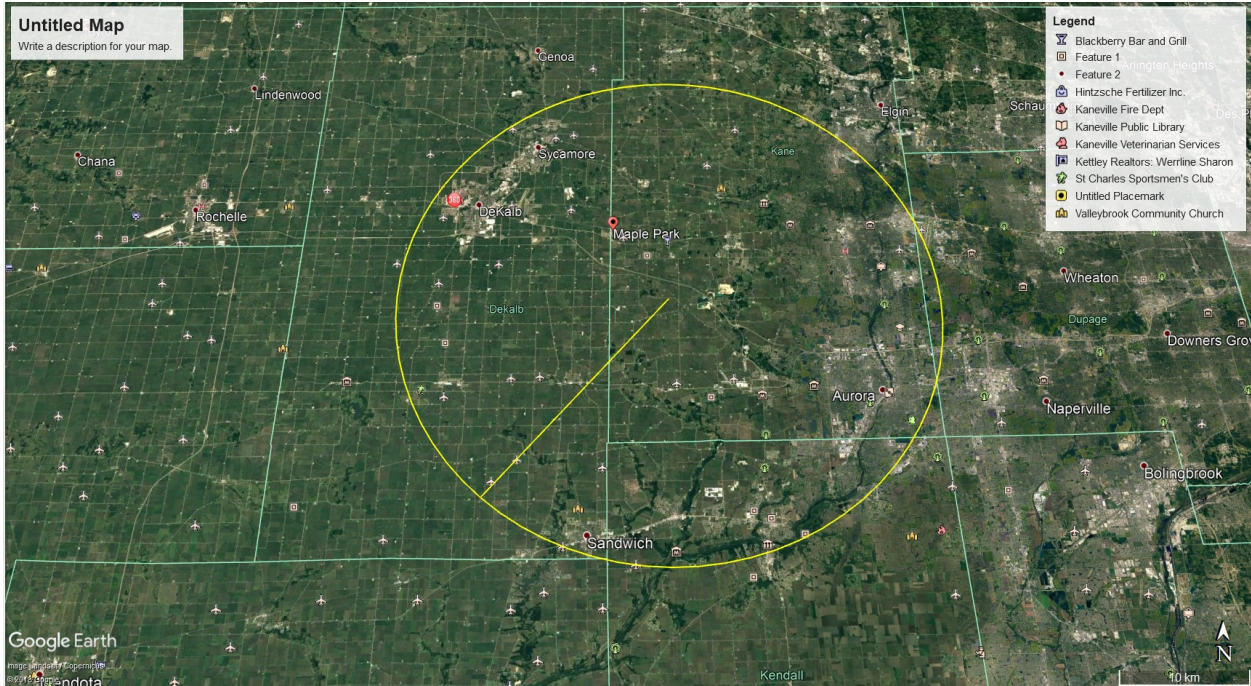


Figure 1- 15 miles circle around the site

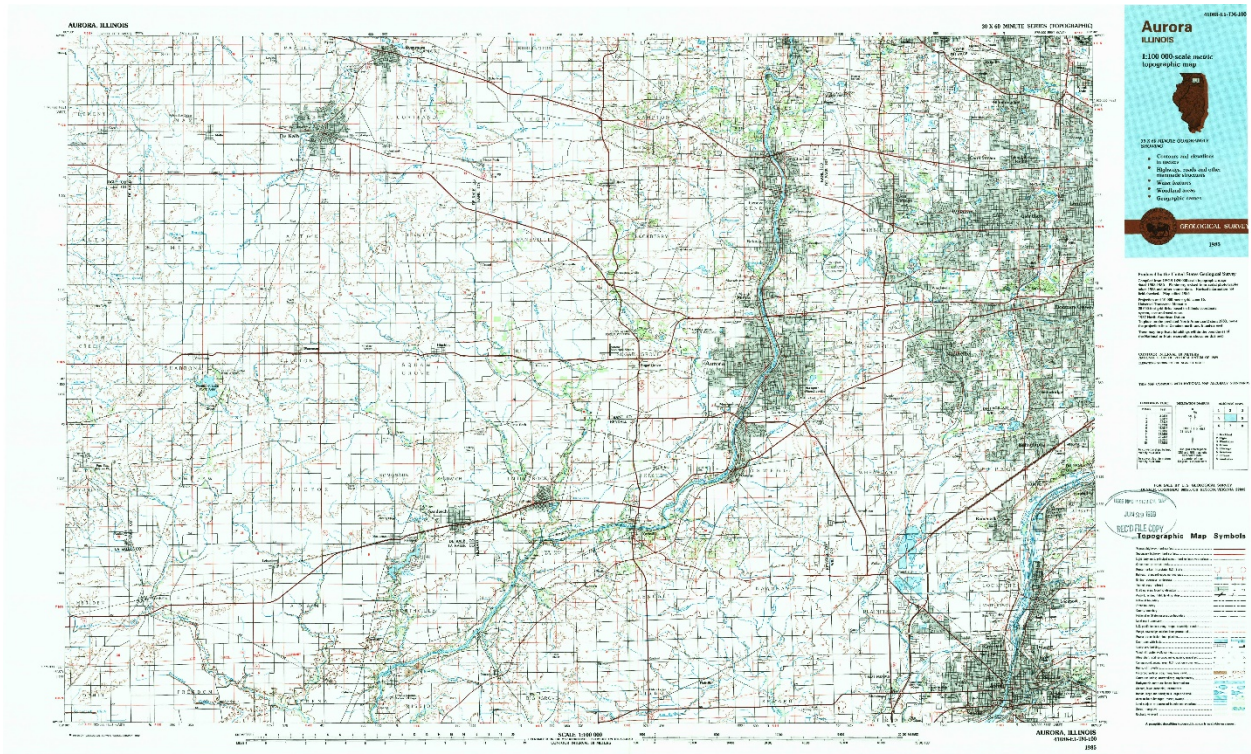


Figure 2- Topographic Map -Aurora

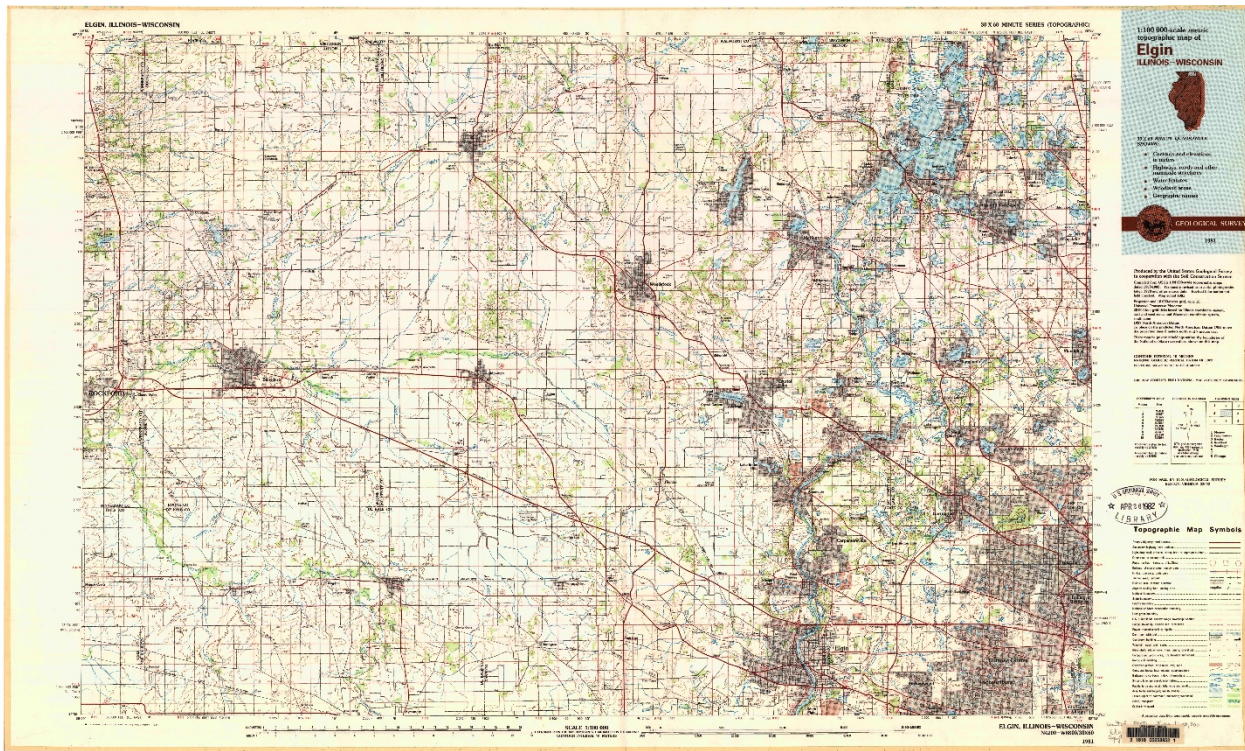


Figure 3-Topographic Map -Ergin



# Exhibit 10

## Block Diagram of the system

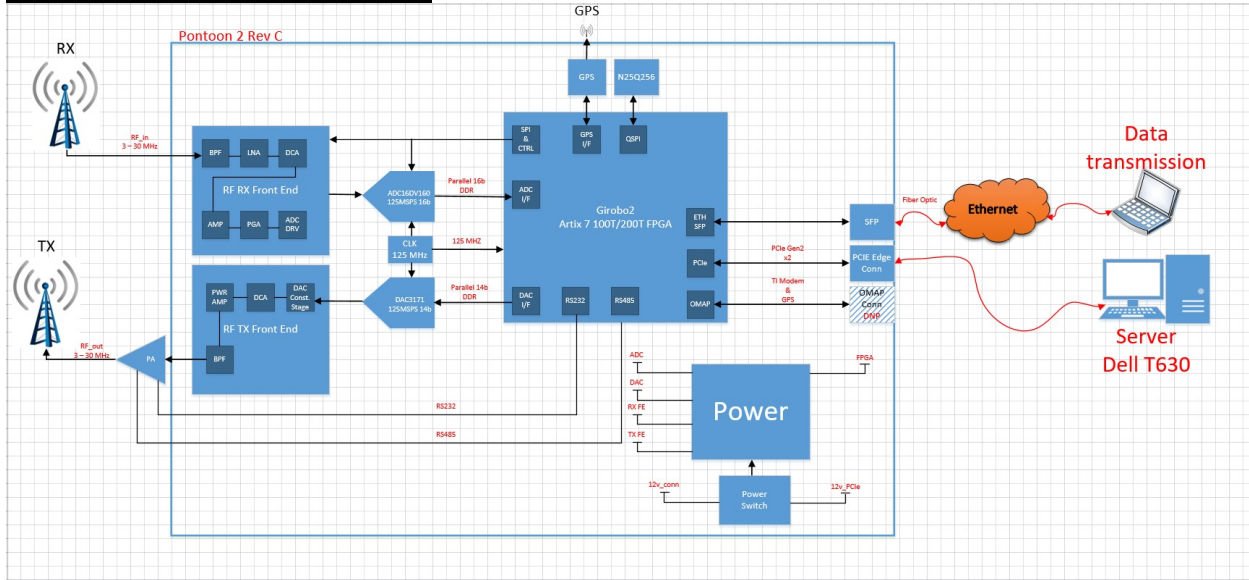


Figure 4 - Radio Block Diagram

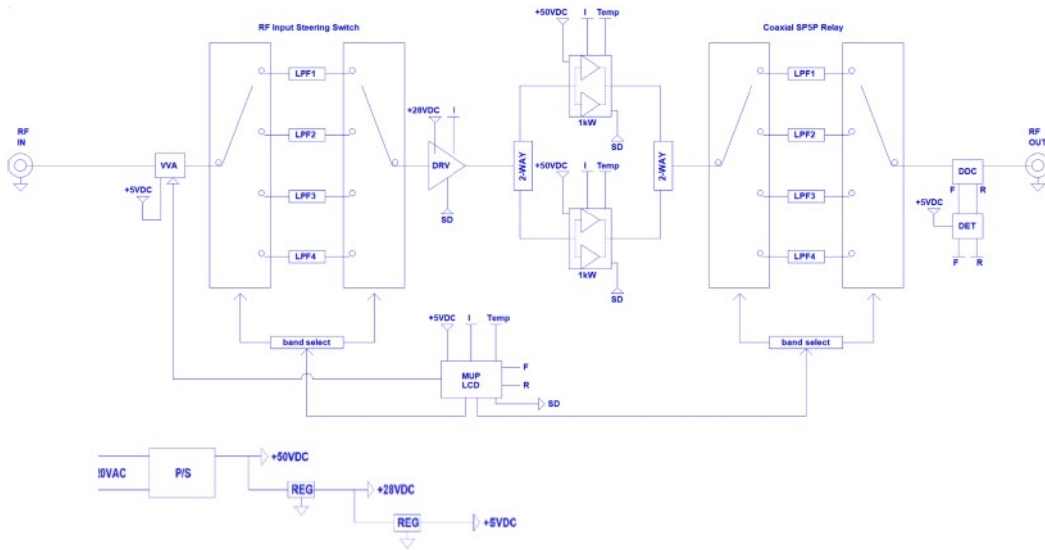
## Power amplifier Block Diagram:



### AMP2056D-FSU

#### SOLID STATE HIGH POWER AMPLIFIER

### SYSTEM BLOCK DIAGRAM



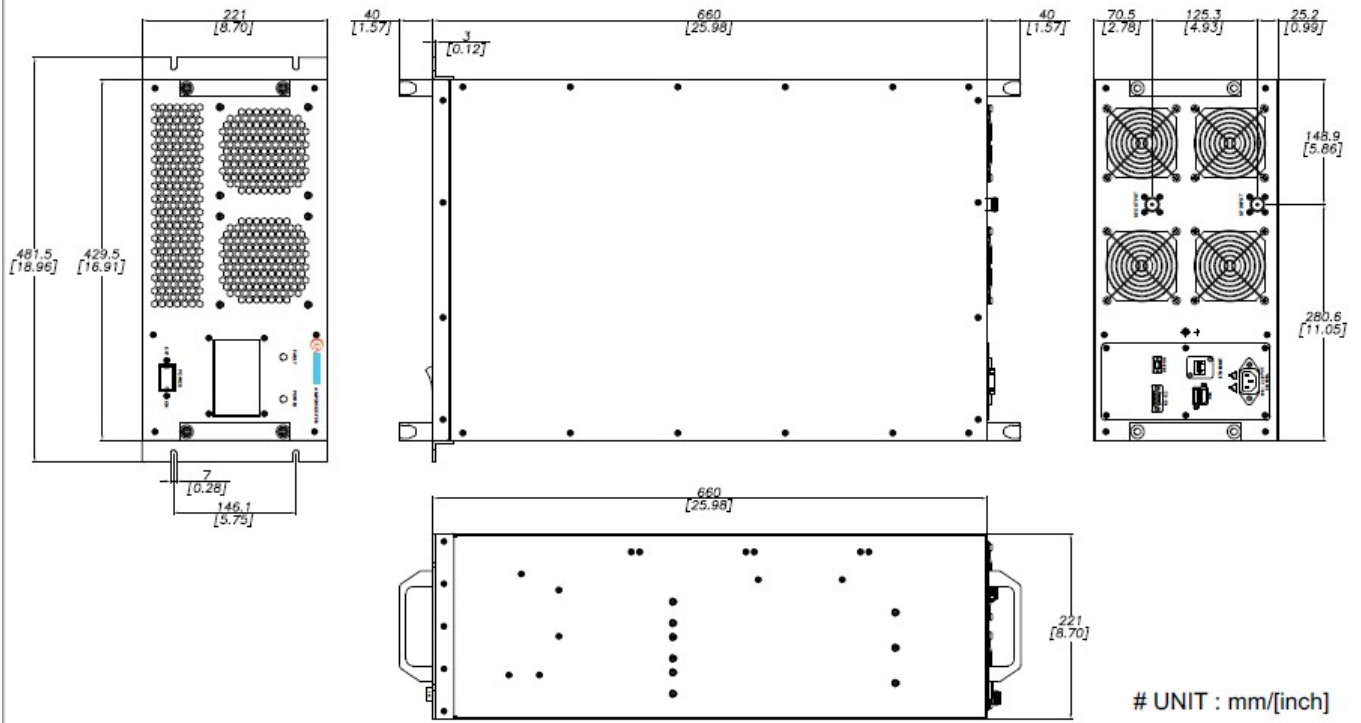
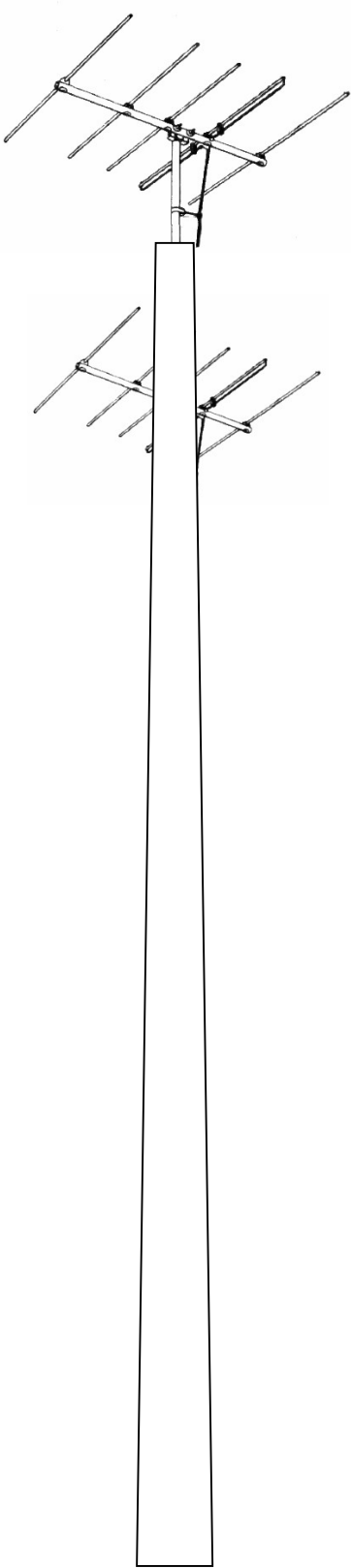


Figure 5-Power Amplifier Block Diagram

# Exhibit 11 – Antenna Structure

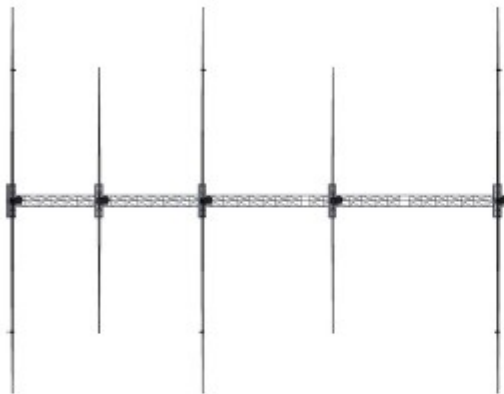


<----- HFT542C Antenna Elevation 155' AGL

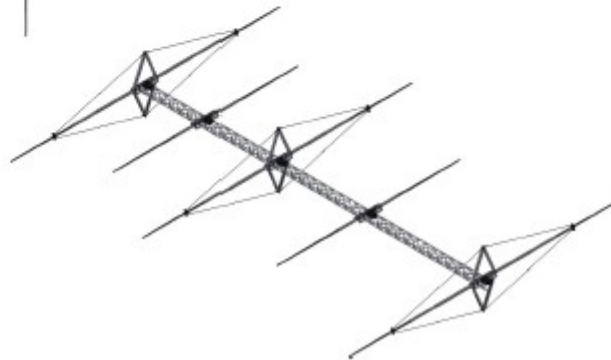
<----- UB 6-40 Antenna Elevation 105' AGL

<----- 150' Monopole

# Exhibit 12– Antenna engineering data thereon:



## HFT540C Yagi Data Sheet



The HFT series Yagis are an industrial grade antenna solution that can be customized to meet the specific requirements of the user. The HFT series antennas are designed to be heavy-duty in order to withstand difficult conditions, while still offering the utmost in reliability and performance that SteppIR products are well known for.

Our patented system utilizes an electronic controller which remotely adjusts each antenna element to the exact length required on every frequency within its range — providing optimal performance with none of the compromises that all fixed length antennas require.

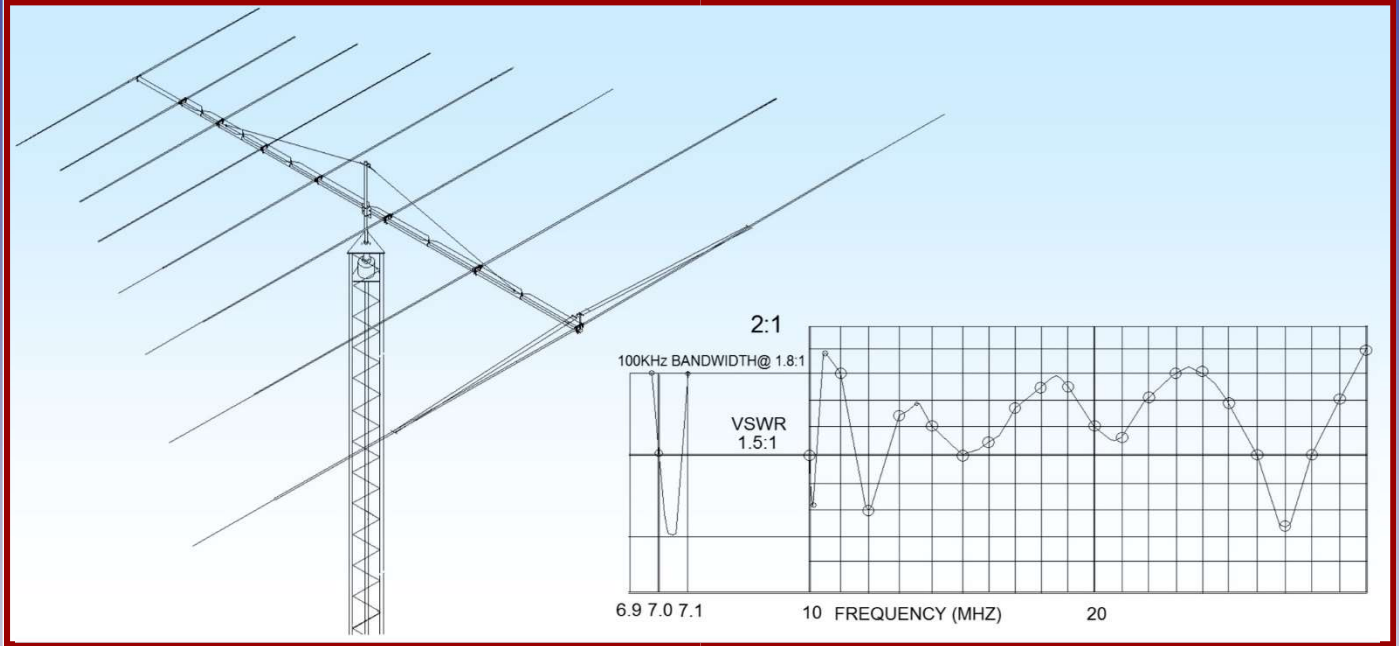
### HFT540C Specifications:

Frequency coverage	6.8-30 MHz—continuous
Active elements	Five
Element Length	Three @ 21.34 m / one @ 12.19 m / one @ 10.97 m
Boom type/Length	Aluminum lattice / 12.19 m
Antenna weight	163 kg— does not include tower connection assembly in weight total
Truss system	Top/bottom truss on 21.34 m elements (see above drawing)
Antenna system	Automatic remote coax switching system; single feed line, relay switched



# M2 Antenna Systems, Inc.

## Model No: 7&10-30LP8



### SPECIFICATIONS:

Model ..... 7&10-30LP8 “Skip log”  
 Frequency Range ..... 10-30 MHz Continuous  
 and a separate frequency tunable from 6.6 to 8.0 MHz  
 \*Gain free space / 65° ..... 5.2 dBi / 10.5 dBi 10-30  
 \*Gain free space / 65° ..... 2 dBi / 6.5 dBi 6.6-8.0  
 Front to back ..... 15 dB 10-30 MHz  
 Beamwidth ..... E=70° Typical  
 Feed Impedance..... 50 Ohms Unbalanced  
 Maximum VSWR ..... 2.0:1

Input Connector ..... SO-239, Others avl.  
 Power Handling ..... 3 Kw Higher avl.  
 Boom Length / Dia ..... 29.5’ / 3.0 x .125 Wall  
 Maximum Element Length ..... 49’  
 Turning Radius: ..... 28’  
 Mast Size ..... 2” to 3” Nom.  
 Wind area / Survival ..... 13.0 Sq. Ft. / 100 MPH  
 Weight / Ship Wt. .... 110 Lbs. / 125 Lbs.

**\*Subtract 2.14 from dBi for dBd**

### FEATURES:

This special "skip frequency" hybrid log periodic is a rugged versatile performer designed for years of trouble free service. For the amateur radio operator it covers **SEVEN** Amateur Bands with high efficiency and no traps! Machined aluminum element to boom clamps and solid fiberglass rod center insulators are just a few of the unique structural features in this remarkable antenna.

The 7&10-30LP8 is a single, economical antenna system that matches up with today’s modern solid state equipment and keeps you competitive on every frequency on every band instantaneously. Low wind load and less weight put less demands on the rotator and tower structures.

Maritime, Government, Commercial, MARS, Scientific and Amateur users are finding the 7&10-30LP8 reliably fills a variety of communication requirements. When properly installed at 65 feet or higher this eight element antenna is a world wide, world-class performer. Solid electrical and structural design will maintain communications when other antennas have long since faded into the noise.

BEFORE YOU BEGIN: Look over the DIMENSION SHEET, HARDWARE AND ELEMENT ASSEMBLY DRAWINGS to get familiar with the various parts of the log periodic. Tools handy for assembly process: screwdriver, 11/32, 7/16, 1/2, 9/16 and 5/8" spin-tites, end wrenches and/or sockets, measuring tape.

*Two containers of zinc paste (Penetrox, Noalox, or equiv.) has been provided to enhance and maintain the quality of all electrical junctions on this antenna. Apply a thin coat wherever two pieces of aluminum come in contact or any other electrical connections are made. It is also useful on screw and bolt threads as an ANTI SEIZE compound.*

**Note: Element Overhead Support has been upgraded. Please see pages titled: Element Overhead Support Upgrade for more details before you start your assembly process.**

1. ASSEMBLING THE ELEMENT MOUNTING PLATE. SEE HARDWARE DRAWINGS.  
The mounting plates fit THREE diameters of fiberglass rod insulators. Pair them up as follows:
  - A. The two 3" x 6" x 1/2" plates milled with a 5/8" radius channel are for ELEMENT #1 (the rear linear loaded element) and clamps a 1-1/4" x 24" fiberglass rod.
  - B. The four other 3" x 6" x 1/2" mounting plates, with a 1/2" radius channel, are for ELEMENTS #2 AND #3 and clamps 1" x 24" fiberglass rods.
  - C. Elements #4 through #7 use a single 2-1/2" x 4" x 3/8" plate and a matching rectangular 1-3/4 x 4" x 1/4" cap plate, and clamps 7/8" x 29-3/4" fiberglass rods. (Elements #4, 5, 6, and 7 use a single bottom cradle each).
  - D. Element #8, the front director element mounts differently, using two clamp cradles as described in step 13.
  - E. Start by assembling the 1-1/4" rod MOUNTING PLATES together with 1/4-20 x 2-1/2" bolts to the four outer holes. Add the 1/4-20 locknuts finger tight. Slip in the 1-1/4" X 24" fiberglass rod and rotate until the element mounting holes are vertical. **Center the rod and tighten the hardware EVENLY, so the plates are parallel and the same amount of threads are showing through all the locknuts.**
2. The Element #1 mounting plate set also requires a 1" square x 24" WELDED VERTICAL SUPPORT POST to anchor element support and the linear loading lines. Orient the post top plates so they will extend over the element center. Install 1/4-20 x 3-3/4" bolts through the post and mount it to the middle two holes of the mount plate and secure with 1/4-20 locknuts. Install two turnbuckles in the plate holes and extend the turnbuckles so one thread on each end appears inside the body in preparation for later steps.
3. Assemble the remaining element clamp plate sets to fiberglass rods. The hardware is as follows: The mounting plate pairs for ELEMENTS #2 & #3 each require (6) 1/4-20 x 2-1/2" bolts and locknuts and a 1" x 24" fiberglass rod. The next three elements (#4 5, & 6) each require (4) 1/4-20 x 1-3/4" bolts and locknuts.
4. For Element #7 attach the Balun Bracket to the top two holes on one of the element clamp plates using two 1/4-20 x 1-3/4" bolts. Insert two 1/4-20 x 1-1/2" bolts in the bottom two holes. Insert the remaining 7/8" x 29-3/4" fiberglass rod and secure all 1/4-20 hardware. See the drawing HARDWARE ARRANGEMENT FOR ELEMENT #7.
5. Now slide a POLY DISC INSULATOR (1-1/4", 1" or 7/8" internal Dia.) onto each end of ALL fiberglass rods and push them up against the mounting plates. The disc insulators are sometimes a very tight fit on the rods. If so, place them in hot water a few moments before installation. Set mounting plates assemblies aside for later.

6. #2 THROUGH #7 ELEMENT ASSEMBLY.

Refer to the DIMENSION SHEET. All the tubing sections with swaged (necked down) ends are 5' (60") long. Only the element tip sections are different lengths. The correct hardware to join the various sizes are as follows:

For 1-1/2" to 1-1/4" tubing uses 8-32 x 1-3/4" screws.

For 1-1/4" to 1" tubing use 8-32 x 1-1/2" screws.

For 1" to 3/4" tubing use 8-32 x 1-1/4" screws.

For 3/4" to 1/2" tips use 5/8" compression clamp (see compression clamp & tip assembly sheet).

Locknuts have been provided for all the element assembly screws. Tighten the nuts until the joint doesn't move when wiggled or shook. The element butt section closest to the boom always has one hole located at the butt for a 1/4-20 bolt, 1/2" longer than the element section diameter. Loosely install the bolts at this time as they must be removed later while installing the elements to the fiberglass rod insulators. Assemble elements #2 through #6. Pair up element halves and set aside.

7. ELEMENT #1 ASSEMBLY. Refer to Element #1 hardware detail & Element #1 Linear Loading Tuning Details.

A. Assemble the 1" x 60" and the 3/4" x 60" outer element sections first. Connect the two sections with 8-32 x 1-1/4" screws and locknuts.

B. Prepare the LINEAR LOADING DUAL SUPPORT ARMS (1" central hole) with (4) 8-32 x 1/4" Allen head SET SCREWS (5/64 Allen wrench supplied), two 8-32 x 1-1/2" screws and locknuts, and a white poly STEPPED INSULATOR (into 3/4" hole). Slide a DUAL SUPPORT ARM on each 1" section and position 27" from the butt end. Orient with the large stepped side of insulator towards element tip and arm in mirror image between element halves. Add the element overhead support clamp I" past the dual support arm on the out portion of the element. WHEN THESE 1" ELEMENT SECTIONS ARE FIT INTO THE 1-1/4" DIAMETER ELEMENT SECTION, ORIENT THE STRAIGHT SIDE OF THE DUAL SUPPORT ARMS UP.

Prepare two ABS LL SUPPORT INSULATORS. These are flat, black 1" x 6" ABS bars. Attach them to the short 3/8" x 1-1/4" x 3" Linear Loading Support arm with 1" hole. Use 8-32 x 1" screws and locknuts. Slide these on the 1" element sections and position at 3" from the butt. Orient the insulators in the same plane as the Dual support arms. Secure with 8-32 x 1-1/2" screws and locknuts.

C. Prepare the (4) 3/4" hole LINEAR LOADING ARMS with two 8-32 x 1-1/4" screws and locknuts and a 1/2" x 1-1/2" white poly linear loading support arms (centered in arm). Slide two arms onto each 3/4" element section. Do not position at this time.

D. Prepare the (2) 1/4" x 1/2" LINEAR LOADING ARMS with two 8-32 x 1" screws and locknuts and a 1/2" x 1" white poly Linear Loading Insulators. Slide arms onto the 1/2" x 67" element tip sections. Install the 1/2" element tip sections to the 3/4" element section using the 5/8" compression clamp (see compression clamp & tip assembly sheet).

E. Install the 1-1/4" x 60" element sections to the outer element assemblies completed in steps A through D. Secure with 8-32 x 1-1/2" screws and locknuts. Set element assemblies aside for now.

F. Prepare the (2) 1-1/2" PHASING LINE CLAMPS BLOCKS AND CAP PLATES by applying a little paste to the channels on each face. Then loosely assemble plates to blocks, channel to channel, with 1/4-20 x 1" FLATHEAD SCREWS AND LOCKNUTS. Loosely install an 8-32 x 2" screw and locknut through block clamp fingers. Apply zinc paste to the last inch of the 1-1/2" element butts and then install a PHASING LINE CLAMP BLOCK assembly onto the end of each element butt, small clamp plate oriented to element butt.

G. Slide a 1-3/8" x 23-13/16" sleeve onto the 1-1/4" fiberglass rod (held by element mounting plates) and align the 1/4" holes. Carefully slide a 1-1/2" x 60" element sections onto this assembly and align all holes. Insert a 1/4-20 x 2" bolt and secure with 1/4-20 locknut. Repeat for the other element half. Now position each phasing line clamp block about 1/4" away from the disc insulator and with the 8-32 element clamp screw oriented to the bottom. Tighten screw and locknut just enough to keep the block from moving (it will be repositioned when phasing lines are installed). Repeat for other element half. Now add the outer element assemblies to the 1-1/2" sections using 8-32 x 1-3/4" screws and locknuts.

H. Place the element on a level surface with the support post up. FROM THE ELEMENT BUTT SIDE, feed a 3/16" x 135" LINEAR LOADING ROD through the ABS LL support insulator and on to the un-insulated side of the DUAL SUPPORT ARM until 5/8" extends beyond arm. Tighten the 8-32 x 1/4" set screws. Install two SHAFT RETAINERS, one at a time, onto this rod tip and snug up to dual support arm.

NOTE: to start the RETAINER, hold the 3/8" x 3" PUSH TUBE in your hand with one end between your thumb and forefinger. Now center retainer on this end, "dish" into tube, and hold in place with the same thumb and forefinger. Grasp the linear loading rod near the end with your other hand and firmly push the retainer onto the rod.

In the same way, feed another 135" LINEAR LOADING ROD through the ABS LL support insulator and on through the white poly stepped insulator until 5/8" extends beyond insulator. Install two SHAFT RETAINERS, one at a time, onto this rod tip and snug up to insulator. Install two 8-32 x 1/4" set screws into a SPLICE BLOCK and install block on 1/2" rod tip up against the retainers. Tighten set screw. Repeat for other element half.

I. Slide a 3/16" x 144" rod through the white poly linear loading insulators on the 3 arms beyond the dual support arm. Insert the inner rod end into splice block at the dual support arm and tighten set screw. SEE THE FREQUENCY CHART on the ELEMENT #1 LINEAR LOADED TUNING DETAILS and select the desired center frequency for Element #1. Cut this outer linear loading rod to the desired dimension. Position the outermost linear loading arm about 6" from the tip. Space the other arms to support the rod at equal intervals. Then tighten all clamp screws. Repeat for other element half.

J. Next, pre-assemble both pair of LINEAR LOADING SHORTING BARS using (5) 8-32 x 7/8" screws and locknuts. NOTE: THE BARS ARE NOT SYMETRICAL IN THE CENTER GROOVES. Now pass about 4" of HPTG-1200 through the CENTER groove and around the strain relief back through the offset grooves so you have about 2-1/2" of cable end coming back for later clamping.

CONSULT THE FREQUENCY CHART and use a tape measure to mark each rod at the CORRECT "A" DIMENSION measured as shown. Slide a shorting bar set onto the rod ends and position the shorting bar clamps at your marks. Level the bars; equalize the rod tension and begin tightening the outer screws. Once everything is straight and aligned, tighten all 5 screws. Repeat for the other side.

NOTE: DO NOT TRIM OFF THE EXCESS ROD BEYOND THE SHORTING BAR TO 5", UNTILL FINAL TUNING IS ACHIVED. IF OPERATION IS DESIRED BELOW 6.950 MHZ, THE FULL LENGTH OF THE LINEAR LOADING RODS MAY BE REQUIRED.

K. Cut the 30 ft. phyllstrand into to equal length and rout though the element support clamps and pull tight. (see the self locking method shown on the addendum) Rout the other end of the cable through the thimble and upper turnbuckles and wire clips and pull tight and tighten the clips, equally tension the cables using the turnbuckle. To check your tension, lift the element up at the center and note the element droop. Each element should droop 10" to 16" at the tip.



- L. Now rout the linear loading phyllstrand through the lower turn buckles and thimbles and add the wire clips. Pull the cable through and tighten the wire clips. Use the turnbuckles to tension them just to slightly help the main element supports.

This completes Element # 1 assembly, set aside for now.

## 8. BOOM ASSEMBLY

Wipe off the swaged end of the front 180" boom section and apply a small amount of light oil. Gently insert it into one drilled end of the straight 180" boom section. Align the holes, install the 1/4 -20 x 3-1/2" bolts and locknuts, and tighten.

NEXT Install the 3/8" EYEBOLTS to the outer ends of the boom, securing with stainless 3/8-16 nuts and lock washers. Align the eyes parallel with the boom and tighten.

9. Orient the boom with the eyebolts "up". The boom end with the eyebolt at 52" from end is the "REAR". Using a tape measure and a marking pen or masking tape, place a mark 1/2" in from the *rear* of the boom. This will be where you position the back edge of the clamp plate for element #1. Now measure forward 78-3/4" from that mark and make another mark. Identify this position as element #2. Continue marking the locations of all the elements using the element spacing figures given on the Dimension Sheet.
10. Attach Element #1, the linear loaded element, to the boom. For ease of element installation, support the boom about 3' above ground, eyebolts "up." Loosely attach two BOTTOM CRADLES to the bottom of the clamp plates using the 1/4-20 x 2-3/4" hardware. Slip Element #1 over the rear of the boom, placing the back edge of the rear plate on your first mark. ALIGN the elements horizontal perpendicular to the eyebolts and tighten bolts EVENLY and firmly. Use element #1 as the element alignment reference.
11. Mount the next element clamp assemblies in element position #2, and #3. First place the clamp plates on the boom at the mark and then add the two bottom cradles and 1/4-20 x 2-3/4" bolts. Align with the first element clamp and tighten *gently*. FINAL ALIGNMENT of all the elements will be done after the elements are mounted.
12. Mount the clamp plates with the 7/8" diameter fiberglass rods, again position each clamp at the mark, aligning with the first clamp and tightening *gently*. Only one cradle is required.
13. Now mount the DIRECTOR. Insert the 3/4" x 60" element sections into the 7/8" x 30" center tube, align the holes and use two 1/4-20 x 5" bolts. Install an inverted cradle onto the bolts and up against the 7/8" sleeve section. Place this assembly on the boom. Add the bottom cradle and locknuts. Align the completed element with the element #1 at the other end of the boom and tighten the nuts. Install the Director's 1/2" tip sections with 5/8" compression clamps.
14. MOUNTING ELEMENT HALVES #2 THROUGH #6. REFER TO DIMENSION SHEET AND HARDWARE ASSEMBLY DRAWINGS.  
Prior to slipping the element halves on the fiberglass insulators, apply a little *zinc oxide paste* to the last inch of each element butt. Apply a little paste to the channels in all the small PHASING LINE CLAMP CAPS and the larger PHASING LINE CLAMP. This paste inhibits corrosion and helps to assure a reliable, low loss joint for many years. Then loosely assemble plates to blocks, channel to channel, with 1/4-20 x 1" FLATHEAD SCREWS AND LOCKNUTS. Loosely install an 832 screw and locknut through block clamp fingers using 8-32 x 1-1/2" screws for 1" clamps and 832 x 1-3/4" screws for 1-1/4" clamps. Install a PHASING LINE CLAMP assembly onto the end of each element butt with small clamp cap oriented to element butt.
15. On element #2, slide 1-1/8" x 24" sleeve over the 1" fiberglass rod end and align the 1/4" holes. Then add the element half (with a 1-1/4" butt sections and a 1/2" tips sections) over the sleeve and rod, align the holes and add a 1/4-20 x 1-3/4" bolt and locknut. Tighten securely. Repeat for the other element half. Repeat for element #3 using element halves with 3/4" tips. Install element halves #4 through #7 to the 7/8" fiberglass rod insulators.

16. Now carefully align elements #2 through #8 to element #1. TIGHTEN each bottom cradle EVENLY AND SECURELY.

17. INSTALLING THE PHASING LINES. SEE DIMENSION SHEET & HARDWARE ASSEMBLY DRAWINGS

Start with the shortest set between element #6 and #7. For each set, feed the phasing lines through a 3/4" x 3" DELRIN SPACER so that the spacer sits at the crossover point between the lines. Hold the spacer in place loosely around the boom with a large nylon tie but don't tighten it yet. Adjust phasing lines so that their bends are even and the lines run parallel to the boom.

- A. Apply a small amount of conductive paste to the rod ends and feed the #7 ends into the clamp block channels until 1/4" extends beyond clamp. Tighten the 1/4-20 x 1" flathead screws and locknuts on element #7. Then adjust the block assemblies flush to the disc insulators and tighten 8 -32 clamp screws. Insert the other rod ends into the clamp block assemblies on element #6 but do not tighten. Continue to the next phasing line set between element #5 and #6. Apply paste and insert the ends into the clamp blocks at element #7 and NOW tighten the flathead screws and nylon ties.

While installing the phase lines, you might find that some of them will extend 1" - 2" past their respective clamp blocks. **This is OK.** You can trim them back, in order to fit flush with the clamp block faces, if you desire.

- B. Continue in the same fashion tightening the hardware and nylon ties as you go.

**Note** the phasing lines between elements #2 and #3: The bends in this set of phasing lines are *offset*, with the *crossover point closer to element #3*. This offset is to allow for I-bolt clearance.

**Note** the phasing lines between elements #3 and #4: The bends in this set are *offset*, with the *crossover point closer to element #3*. This offset is to allow proper placement of the boom to mast plate.

- C. Attach the 16 turn COIL to element #1 screw studs before securing phasing lines. Position coil upright, but clearing the support post and tighten the nuts. Try to keep coil tightly wound, spread no more than 5" to 6".

18. MOUNTING THE 4:1 BROAD BAND BALUN

Secure the BALUN to the BALUN BRACKET with a 2-1/2" U-bolt and cradle. Tighten nuts only enough to secure balun. DO NOT OVER TIGHTEN - BALUN HOUSING COULD BE DAMAGED!

Position balun with the connector pointing towards the rear of the boom and leads easily reaching phasing line clamps screw studs. Now remove the 1/4" nuts from the clamp block screws. Apply some zinc paste to the lugs on the balun leads and place over each screw stud. Replace the nuts and re-tighten.

19. Attach the BOOM TO MAST PLATE with the two large 3" U-bolts. Center it at the Delrin standoff between element #3 and #4. Reshape the phasing lines as needed to clear the plate by at least 1/2".

20. OVERHEAD BOOM SUPPORT SYSTEM.

- A. Attach one end of the 5/16" Dacron cord to the rear eyebolt using two turns around the eyebolt and a series of three half hitches or equivalent knots. Finish with about 6" of cord after the knots. ***Without cutting the cord, do the same at the front eyebolt.*** Pull on the knots **HARD** to **SET** them. Seal ends with heat or flame to prevent fraying. Tape the excess 6" of cord back to main cord tightly with black vinyl electricians tape.

- B. TEMPORARILY insert a 2" U-bolt through the turnbuckle plate and add two nuts so about 1/2" of the threads stick out. Insert this assembly through the top set of 2" U-bolt holes in the boom to

mast plate from the boom side and add two more nuts. Open the two turnbuckles up until just *a thread or two* from each end shows *inside* the body of the turnbuckle. Hook the turnbuckles into the holes at the edge of the turnbuckle plate. Equalize the Dacron cord over the plate and cut it. Take two wraps of the cord through the eye of the rear turnbuckle, PULL the cord as tight as possible and make the knots as before. Repeat for the front cord section and turnbuckle. Cut off any excess over 1' long and again seal and tape back to the main cord.

- C. Now DISASSEMBLE the U-bolt from the boom to mast plate. Before installation, if possible, install a short temporary mast, attach turnbuckle, and let the overhead guy system support the boom overnight. The Dacron cord DOES NOT STRETCH UNDER THIS LOAD but it's weave will take a SET and the boom may droop just a bit. If your boom droops again following final adjustments, check your knots. They may be slipping.
- D. After final installation of the antenna, the turnbuckle plate, installed loosely with a 2" U-bolt, is raised up the mast. When the boom is straight the U-bolt is tightened. This should place the turnbuckle plate 4' to 6' above the boom. Do the final boom straightening with the turnbuckles and safety wire to preserve adjustments.
- 21. Install all element tip sections that may have been removed or omitted to facilitate other assembly procedures.
- 22. Check ALL hardware for tightness. Check ALL element sections, especially tip sections, for correct placement. Make any final adjustments to linear loading tension.
- 23. Attach feed line section to balun. Secure at regular intervals with tape or nylon ties.
- 24. When mounting this log periodic on a tower or mast with other antennas there may be interaction with other nearby antennas, particularly if they are resonant in the 7 to 30 MHz band. In general VHF and/or UHF antennas mounted for HORIZONTAL POLARITY should be at least 40 inches above or below the log antenna. Use good quality 50 Ohm feed line to feed the log and be sure your tower and rotator system can handle to wind area and weight of this antenna.

THIS COMPLETES THE ANTENNA ASSEMBLY

**M<sup>2</sup> ANTENNA SYSTEMS, INC.**

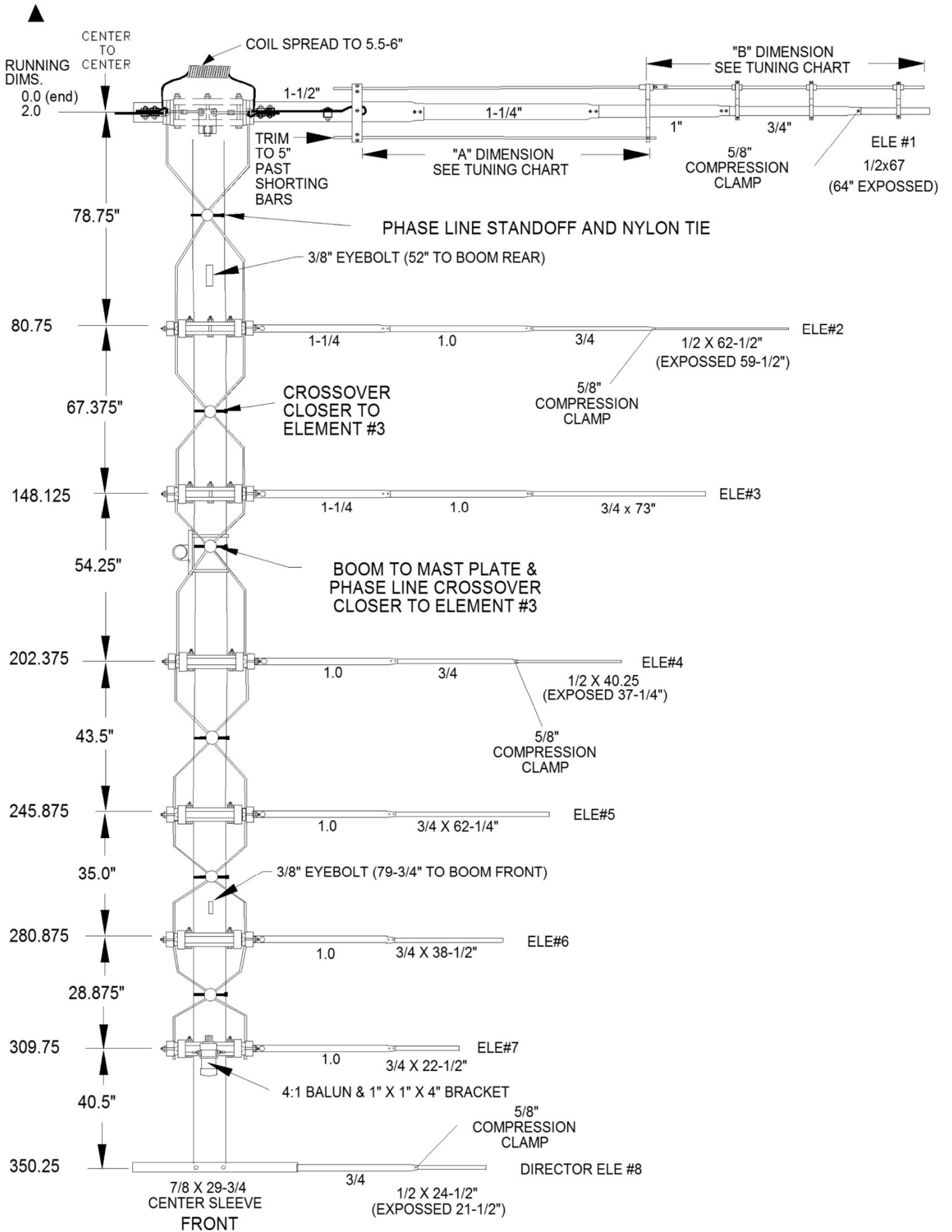
4402 N. SELLAND AVE.

FRESNO, CA 93722

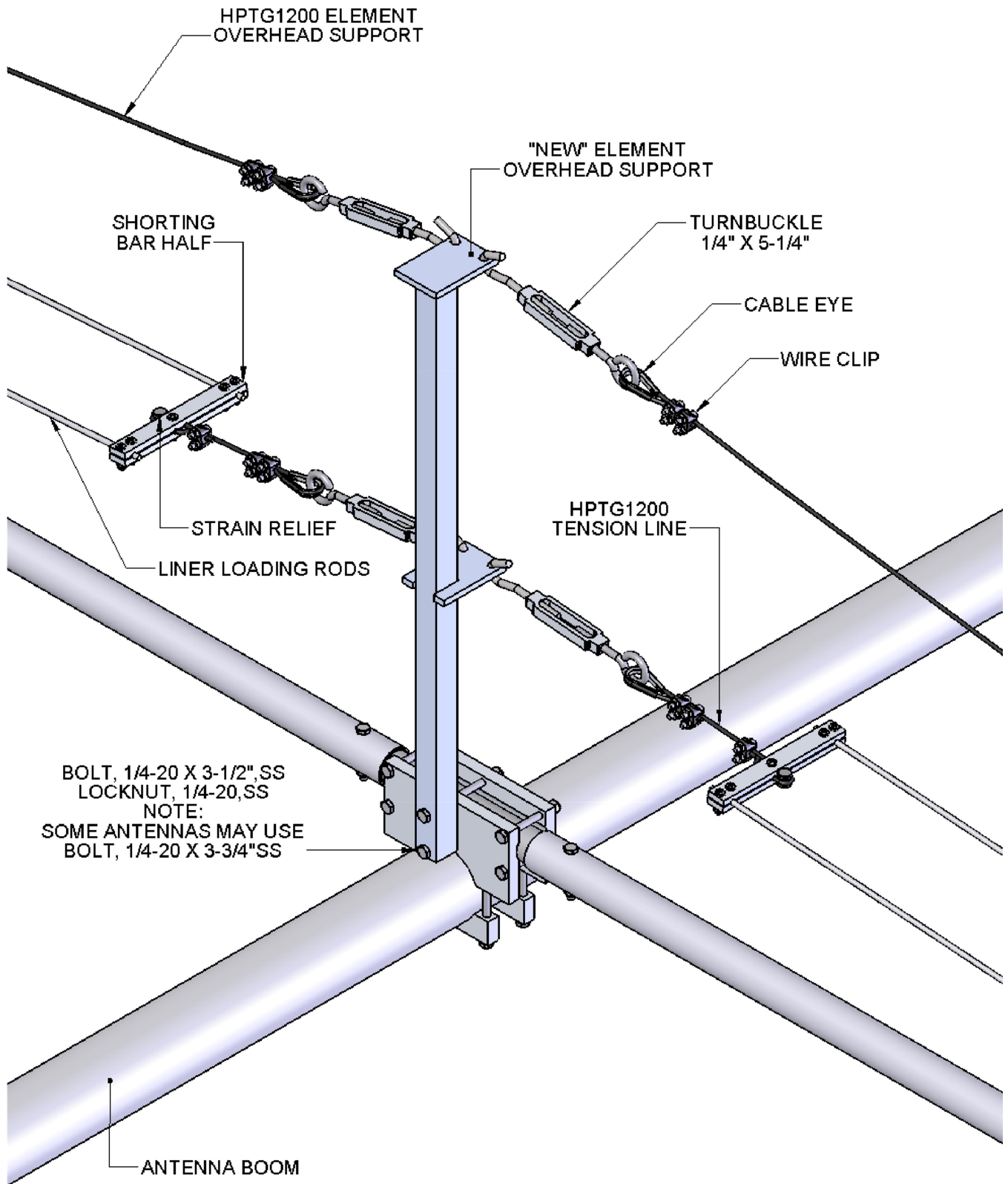
(559) 432-8873 Fax: 432-3059

www.m2inc.com Email: sales@m2inc.com

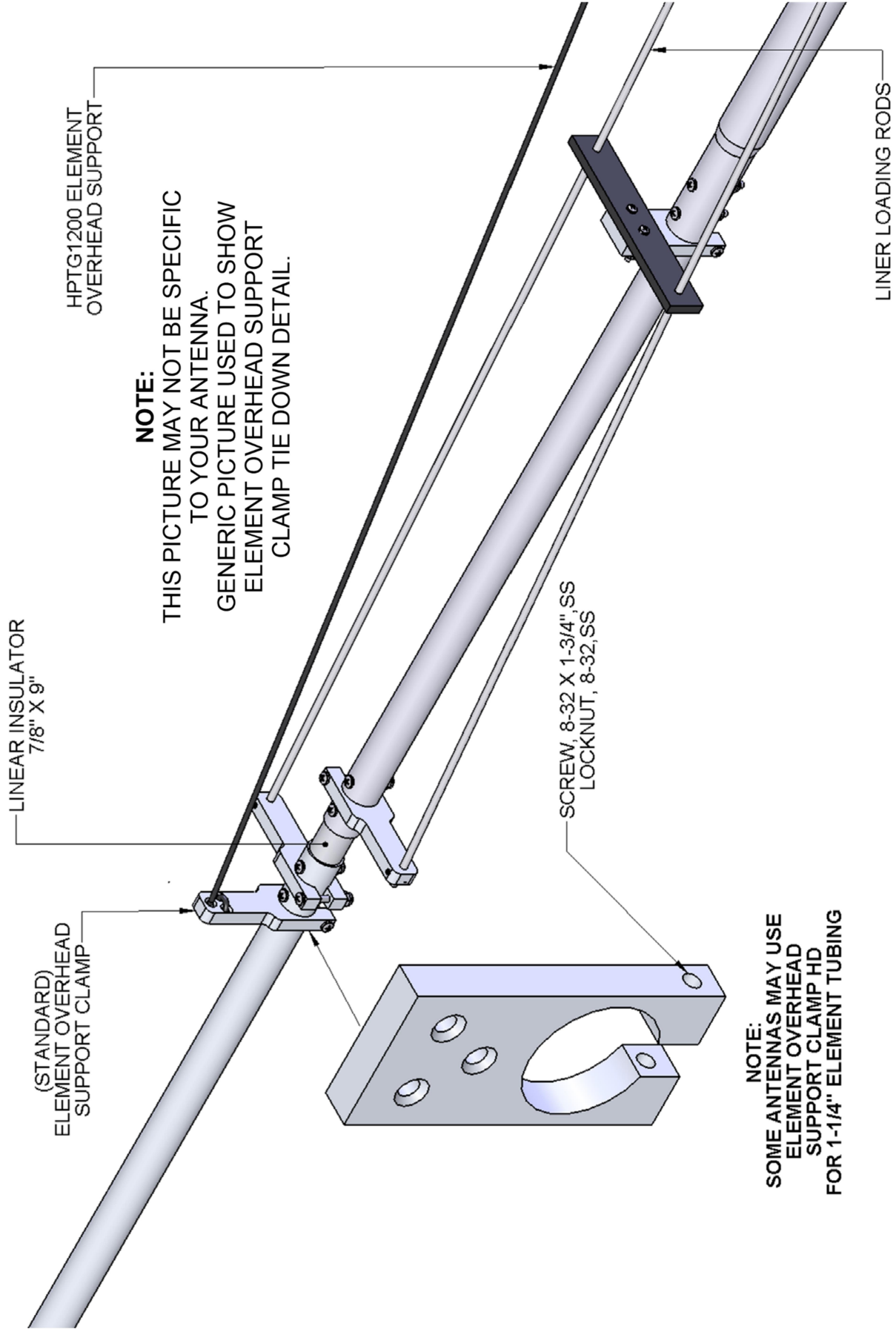
# 7&10-30LP8 DIMENSION SHEET



# ELEMENT OVERHEAD SUPPORT UPGRADE 2M4 ASSEMBLY MANUAL







HPTG1200 ELEMENT OVERHEAD SUPPORT

**NOTE:**  
 THIS PICTURE MAY NOT BE SPECIFIC TO YOUR ANTENNA.  
 GENERIC PICTURE USED TO SHOW ELEMENT OVERHEAD SUPPORT CLAMP TIE DOWN DETAIL.

LINEAR INSULATOR  
 7/8" X 9"

(STANDARD)  
 ELEMENT OVERHEAD  
 SUPPORT CLAMP

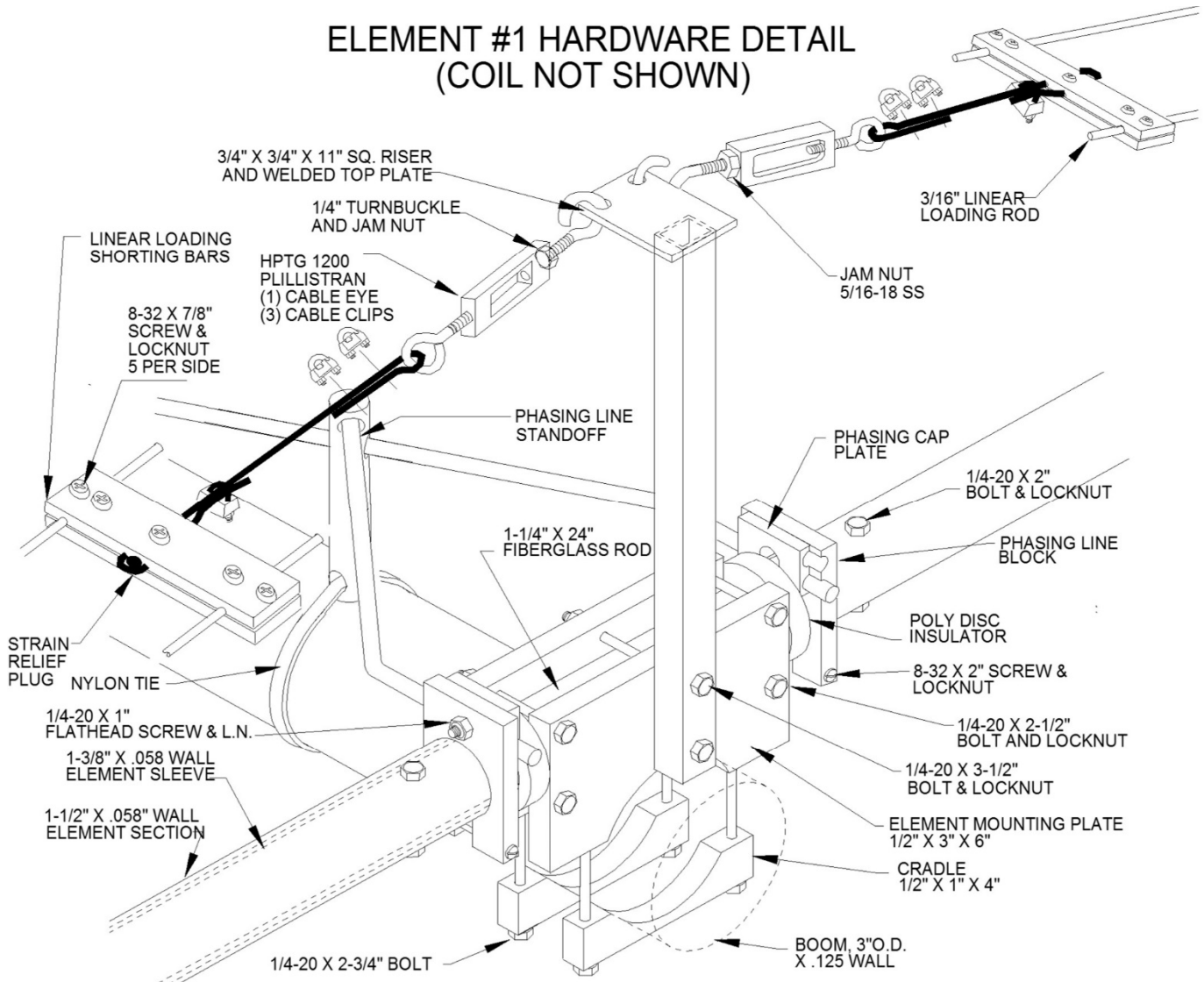
SCREW, 8-32 X 1-3/4", SS  
 LOCKNUT, 8-32, SS

LINER LOADING RODS

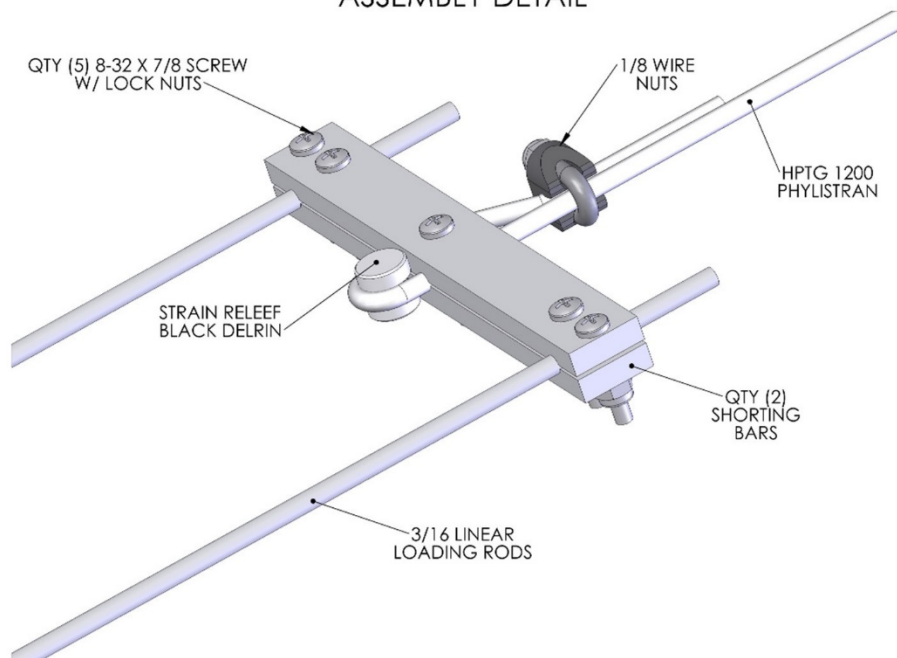
**NOTE:**  
 SOME ANTENNAS MAY USE  
 ELEMENT OVERHEAD  
 SUPPORT CLAMP HD  
 FOR 1-1/4" ELEMENT TUBING

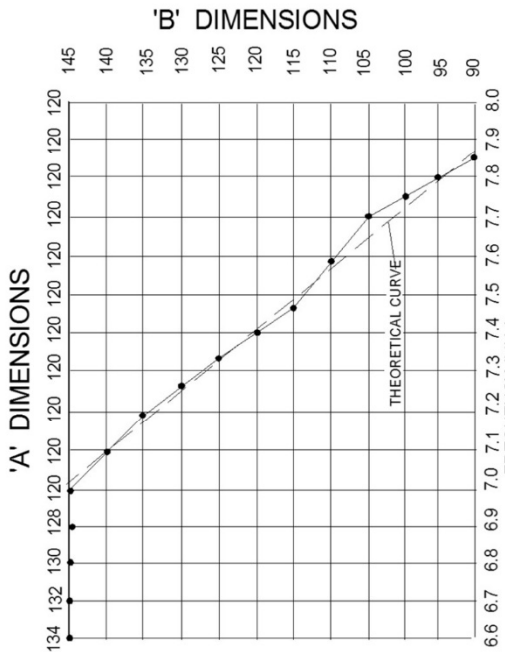


## ELEMENT #1 HARDWARE DETAIL (COIL NOT SHOWN)



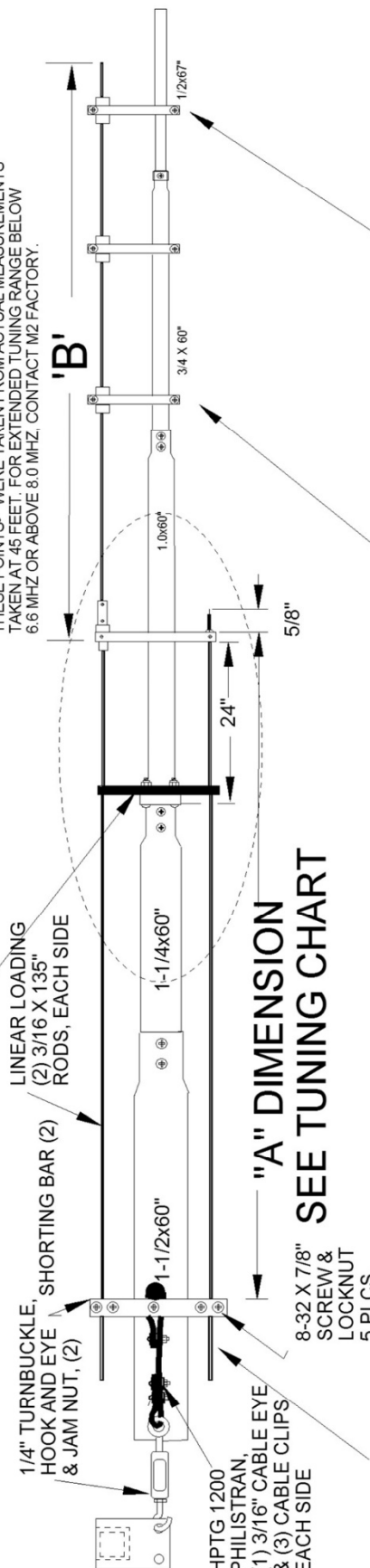
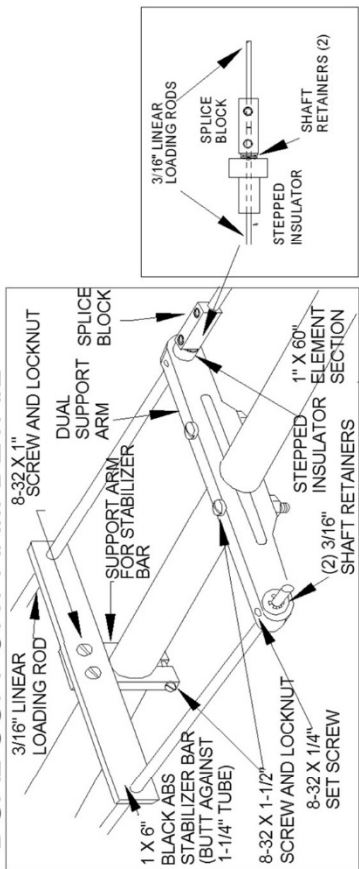
## SHORTING BAR AND HPTG PHYLLISTRAN ASSEMBLY DETAIL





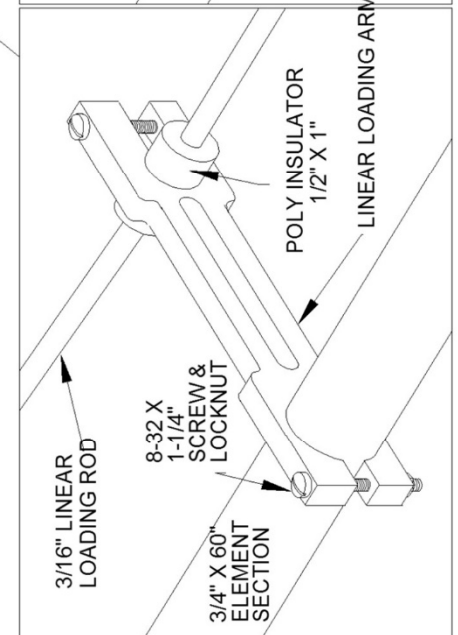
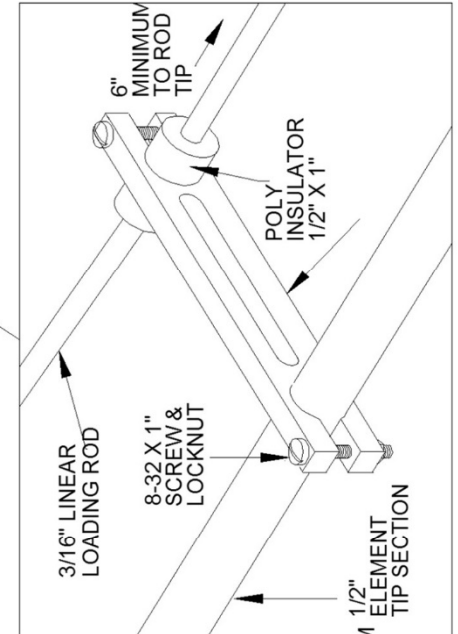
THESE POINTS WERE TAKEN FROM ACTUAL MEASUREMENTS TAKEN AT 45 FEET. FOR EXTENDED TUNING RANGE BELOW 6.6 MHZ OR ABOVE 8.0 MHZ, CONTACT M2 FACTORY.

### DUAL SUPPORT ARM DETAIL



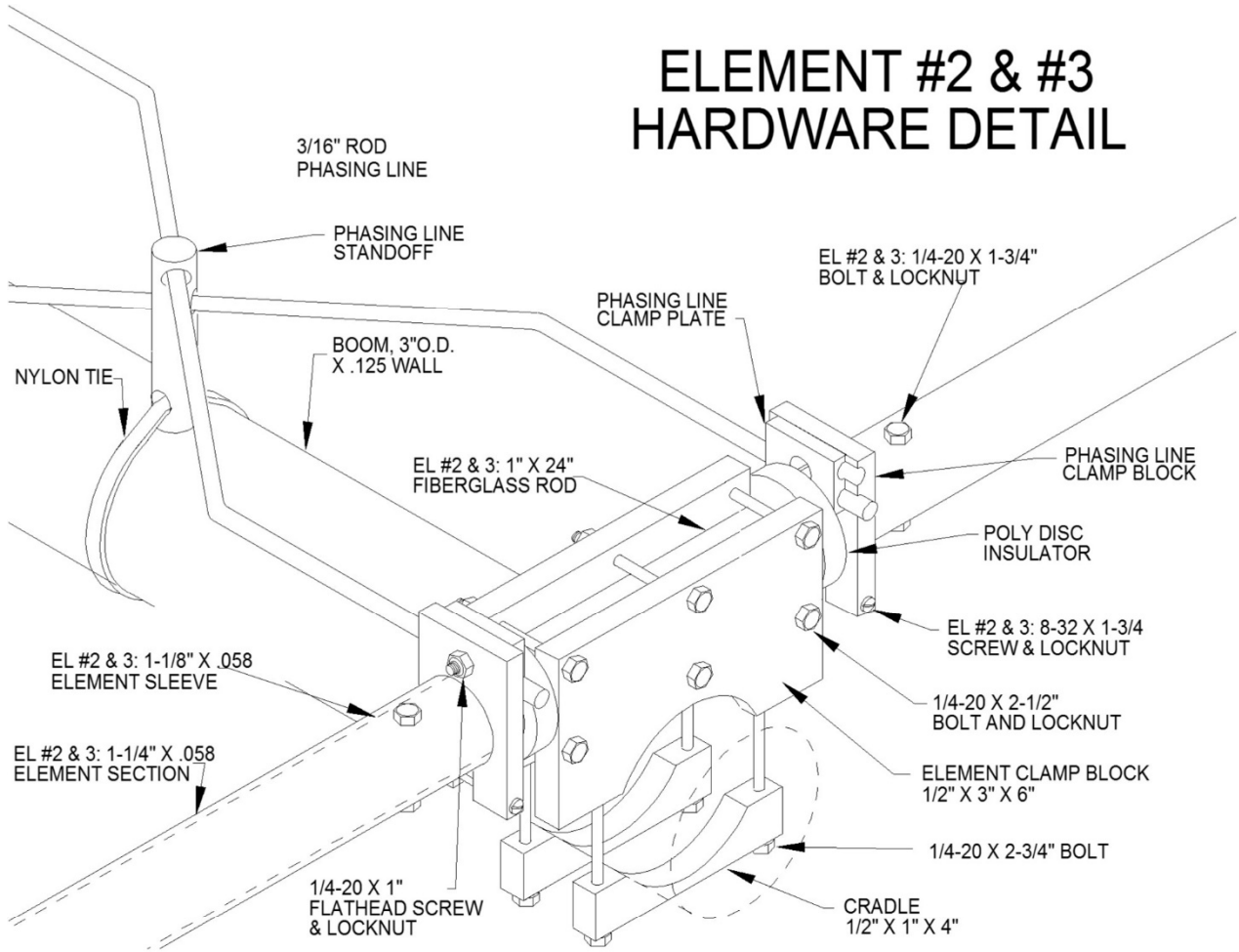
"A" DIMENSION SEE TUNING CHART

TRIM OFF EXCESS 3/16 ROD TO 5" PAST SHORTING BAR

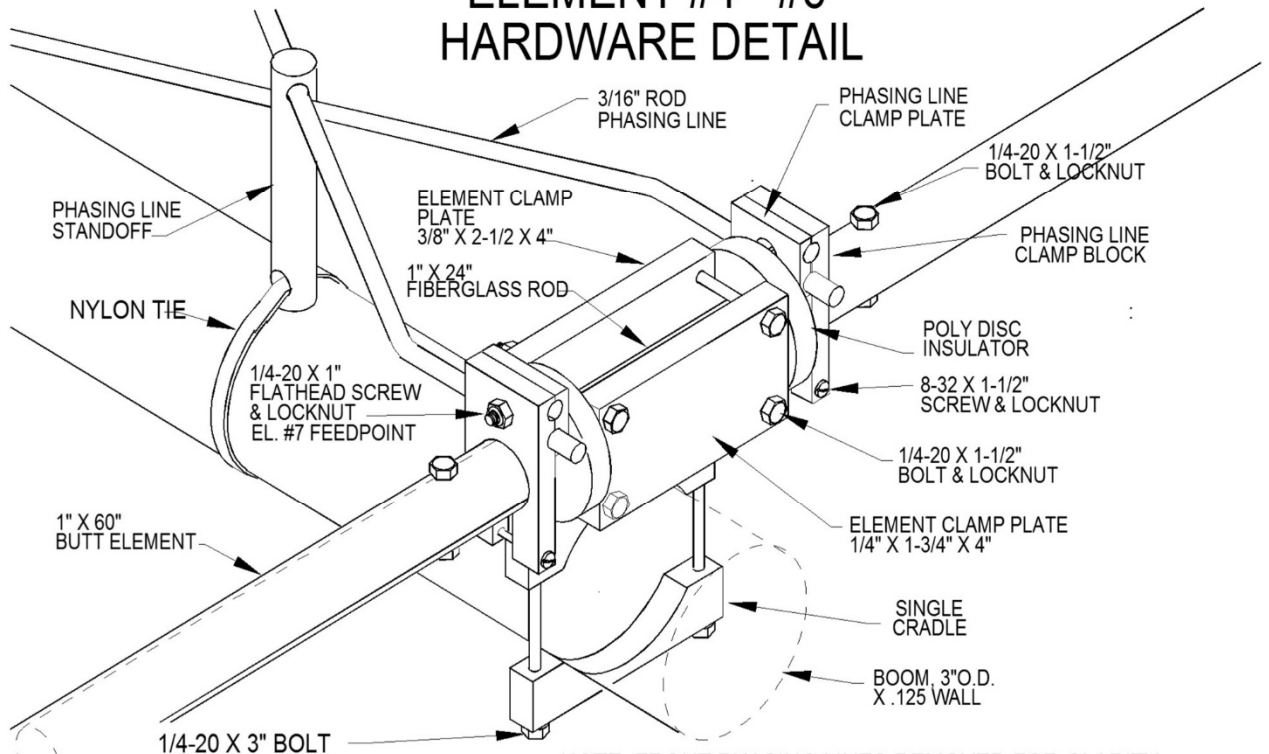


## 7&10-30LP8: ELEMENT #1 LINEAR LOADING TUNING DETAILS

# ELEMENT #2 & #3 HARDWARE DETAIL

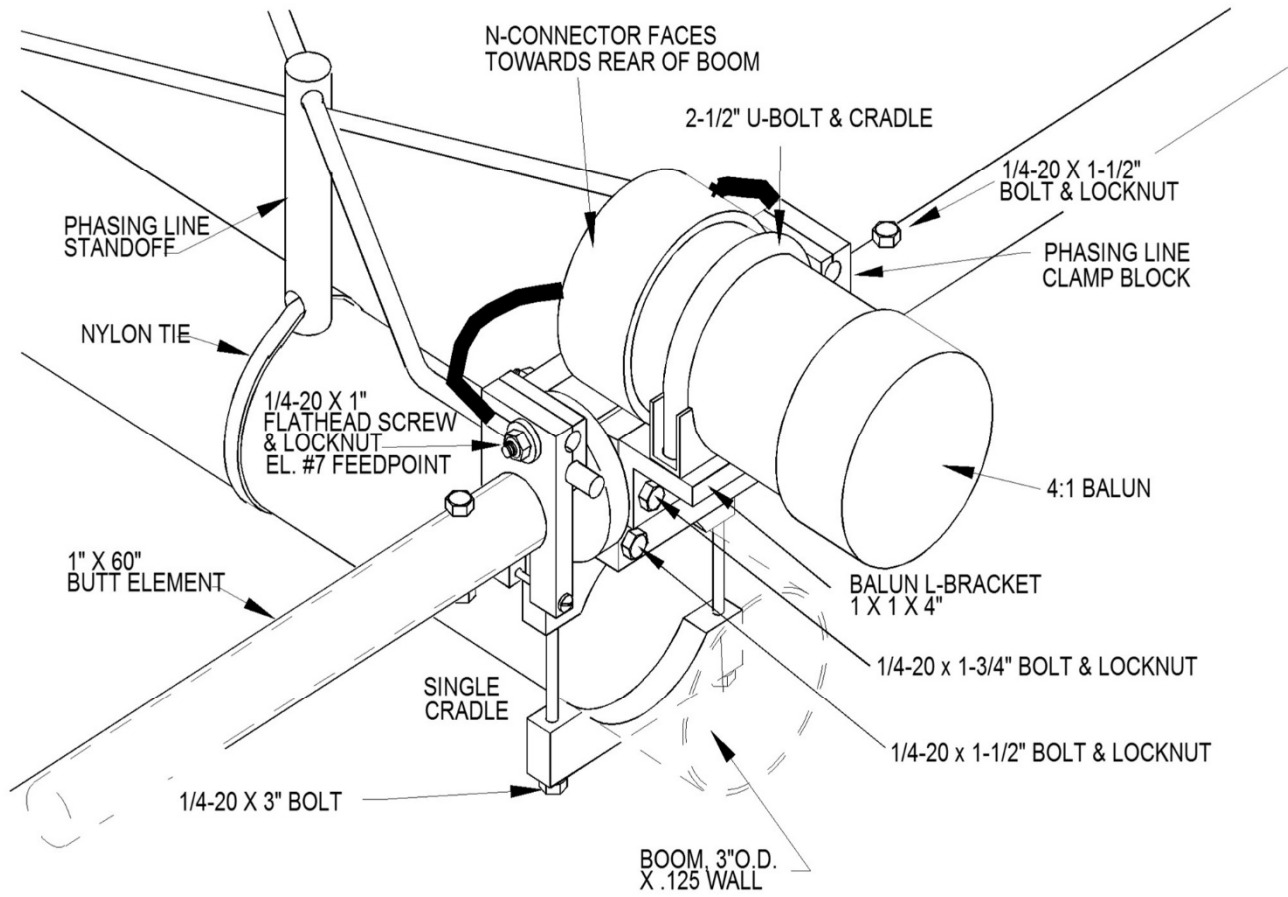


# ELEMENT #4 - #6 HARDWARE DETAIL

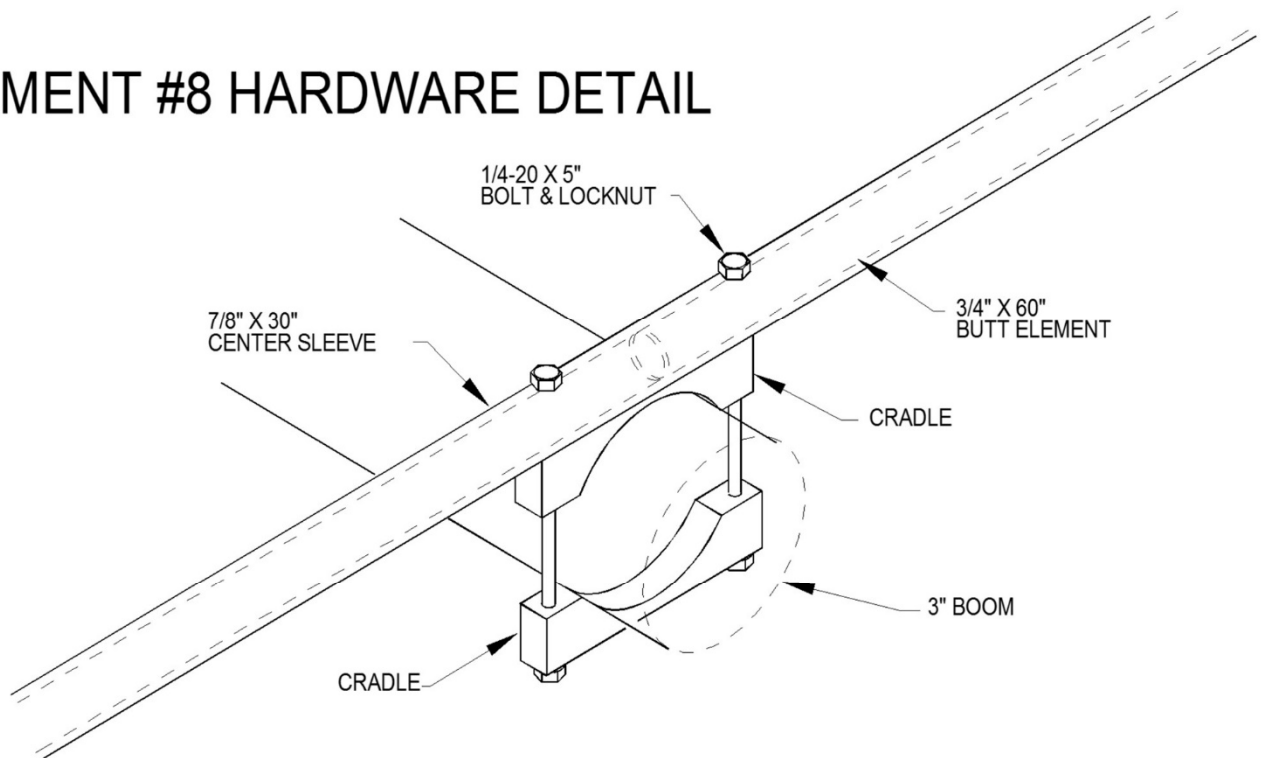


NOTE: FRONT PHASING LINES REMOVED FOR CLARITY

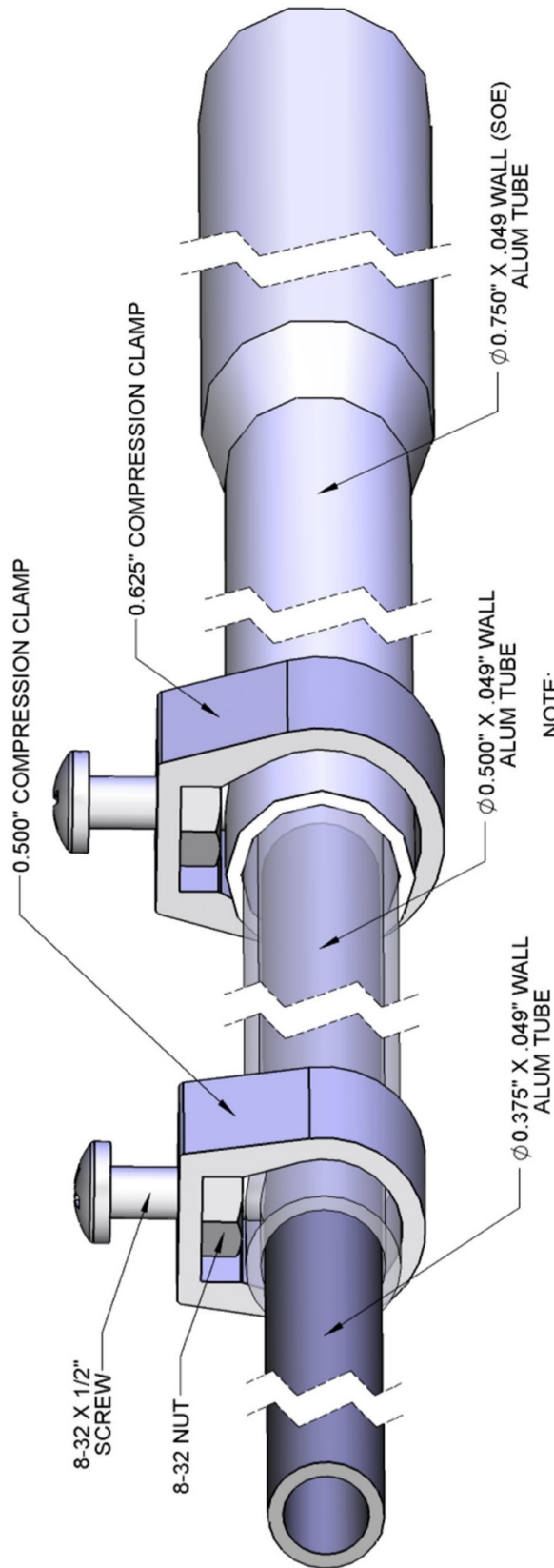
# ELEMENT #7 HARDWARE DETAIL



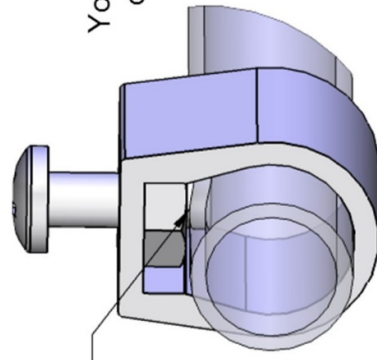
# ELEMENT #8 HARDWARE DETAIL



# GENERIC COMPRESSION CLAMP DETAIL



NOTE:  
TUBES SHOWN TRANSPARENT  
TO SHOW MORE DETAIL



NOTE:  
8-32 X 1/2" SCREW  
PRESSES ON INNER TUBE

NOTE:  
Generic layout to show  
how compression clamps work.  
Your antenna may have one or the other  
or may even have both compression  
clamp sizes.

NOTE: INSIDE TUBE NOT SHOWN FOR CLARITY

## 7&10-30LP8 PARTS & HARDWARE

DESCRIPTION	QTY
Boom section, 3 x .125 x 180" swaged .....	1 Boom
section, 3 x .125 x 180" straight .....	1 Sleeve,
Director 7/8x.058x30 .....	1 Sleeve, 1-3/8 x
.058 x 23-13/16" .....	2 Sleeve, 1-1/8 x .058 x
23-13/16" .....	4 Element, 1-1/2 x .058 x 60"
SOE, .....	2 Element, 1-1/4 x .058 x 60" SOE
1/4" hole .....	4
Element, 1-1/4 x .058 x 60 SOE .....	2
Element, 1.0 x .058 x 60 SOE .....	6
Element, 1.0 x .058 x 60" SOE 1/4" hole .....	8
Element, 3/4 x .049 x 60" SOE .....	6 Element,
3/4 x .049 x 60" SOE 1/4" hole .....	2 Element tip, 3/4 x
.049 x 73.00" .....	2
Element tip, 3/4 x .049 x 62.25" .....	2
Element tip, 3/4 x .049 x 38.50" .....	2 Element
tip, 3/4 x .049 x 22.5" .....	2 Element tip, 1/2
x .049 x 67.0" .....	2 Element tip, 1/2 x .049 x
62.50" .....	2
Element tip, 1/2 x .049 x 40.25" .....	2 Element
tip, 1/2 x .049 x 24.5" .....	2 Log phasing rod,
3/16 x 83.75" .....	2 Log phasing rod, 3/16 x
72.375" .....	2 Log phasing rod, 3/16 x 59.25"
.....	2 Log phasing rod, 3/16 x 48.5"
.....	2
Log phasing rod, 3/16 x 41.0" .....	2
Log phasing rod, 3/16 x 35.0" .....	2 Linear
loading rod 3/16 x 144" alum. rod .....	2 Linear loading
rod 3/16 x 135" alum. Rod .....	4
Fiberglass rod insulator, 1-1/4 x 24" .....	1
Fiberglass rod insulator, 1 x 24" .....	2
Fiberglass rod insulator, 7/8 x 29.75" .....	4
Vertical support post, SQ. tube, 3/4 sq. x .125 x 11" alum .....	1
Boom to mast plate, 8 x 8 x 1/4" alum. ....	1
Balun, 4:1 ferrite core, 3 kW .....	1
Coil #10 AWG, 16 Turn .....	1

### ELEMENT OVERHEAD SUPPORT UPGRADE ..... QTY

Support Post, LL, 1" X 1" X 24" (M2AVR0050) .....	1
Element Overhead Support Clamp .....	2
Element Overhead Support Line, HPTG1200 x 30' .....	1
Turnbuckle, 1/4 X 5-1/4", Hook and Eye .....	2 Cable
Eye, 6/16" .....	2 Wire Clip, 1/8"
.....	4
Bolt, 1/4-20 x 3-1/2" .....	2 Locknut,
1/4-20,ss .....	2
Nut, 1/4-20,ss .....	2
Screw, 8-32 x 1-1/2", Pan Head Phil,ss .....	2
Locknut, 8-32,ss .....	2

## 7&10-30LP8 PARTS & HARDWARE

### IN HARDWARE BOX

Element mounting plate, 1/2 x 3 x 6", .625 radius, alum .....	2 Element
mounting plate, 1/2 x 3 x 6", .500 radius, alum .....	4 Small element

mounting plate, 1/2 x 2-1/2 x 4" alum. ....	4	Small element
mounting cap, 1/4 x 1-3/4 x 4" alum. ....	4	
Cradle 3.0 LD, 1/2 x 1.0 x 4" alum. ....	12	
Phase line clamp, 3/8 x 1-3/4 x 2-5/8" with 1-1/2" hole .....	2	Phase
line clamp, 3/8 x 1-1/2 x 2-7/16" with 1-1/4" hole .....	4	
Phase line clamp, 3/8 x 1-1/4 x 2-3/16" with 1" hole .....	8	
Phase line clamp cap, 1/4 x 3/4 x 1-1/4" .....	14	Poly
Disc insulator, 3/8 x 2" polyethylene, 1-1/4" hole .....	2	Poly Disc
insulator, 3/8 x 2" polyethylene, 1" hole .....	4	
Poly Disc insulator, 3/8 x 2" polyethylene, 7/8" hole .....	8	Linear
loading insulator, 1/2 x 1-1/2" Polyethylene, .201 hole .....	6	Splice Block,
linear loading, .25 x .5 x 1" .....	2	Stepped insulator, 3/4
x 1-1/2" Polyethylene, .201 hole .....	2	Phase line standoff, 3/4 x 3.0"
Delrin, Machined .....	6	ABS LL support insulator, 1/4C x 1 x
6" Black ABS plastic .....	2	Linear loading dual support arm, .375 x 1.5 x
5.75" 1" hole .....	2	
Linear loading staibilizer support arm, 1" hole, Mach alum .....	2	
Linear loading support arm, .25 x 1 x 3.875, alum. 3/4 and 1/2" hole .....	4	
Linear loading support arm, .25 x .75 x 3.875, alum. 1/2" holes" .....	2	
Linear loading shorting bar, 1/4 x 3/4 x 5.875" .....	4	
Strain relief, 1/2 x 1/2 blk delrin .....	2	
Turnbuckle plate, 2 x 5 x 3/16" .....	1	
Balun Bracket, 1 x 1 x 4" .....	1	
Eyebolts, 3/8" x 6" .....	2	
Turnbuckles, 3/8" hook and eye .....	2	
Support rope, 5/16 x 30 ft. Dacron, .....	1	U-
bolt, 3" .....	3	
U-bolt, Heavy Duty, 2", 3/8 .....	4	U-
bolt, standard 2" .....	1	U-bolt,
2-1/2" .....	1	5/8"
Compression clamp .....	8	
Turnbuckle, hook and eye, 1/4" .....	2	
Cable eyes, 3/16" .....	2	
Cable clips, 3/16" .....	6	
HPTG-1200 Phillistran cable, 36" .....	2	
Nylon ties, large 14.5" black .....	10	
Assembly manual .....	1	
Zinc Paste ( Penetrox, Noalox or equivalent) container .....	2	

# 7&10-30LP8 VSWR

