

Proposed Operational Requirements

To Whom It May Concern,

We are currently on contract from the Missile Defense Agency (Contract Number: FA8818-08-D-0038) **SRALT DX-A2** within the U.S. Department of Defense to provide a threat representative target for an upcoming missile interceptor test. As part of our test process, we assemble and functionally test the target at our Orlando facility. During test, we capture telemetry from 10 watt L-band and C-band transmitters within the following frequencies 2214.50-2276.50 MHz (62 MH Bandwidth) and 1460.5-1476.5 MHz (16Mh Bandwidth) at a 10W (20W ERP). We are in the process to determine if an FCC license is needed to radiate within our building to test our telemetry system. Our current contract calls for testing to start on August 18, 2014 and continue to intermittently test through February 19, 2015. Any effort to expedite this process would be greatly appreciated.

The purpose for these tests are to determine that a Telemetry link consisting of a variety of sensors, a PCM encoder with encryption, and transmitter has the proper spectrum to satisfy the link margin for a PCM/FM modulated system for a BER of 10E-6 with a signal to noise ratio of 12.4dB.

In order to demonstrate that the system meet the goals, the deviation has to be set correctly and is monitored via a spectrum analyzer along with observing eye-patterns of the demodulated signal.

By performing these tests prior to deployment, a minimum power level to achieve these goals can be determined empirically using telemetry test equipment and additional attenuators. Normally a link budget is performed analytically but performing the analysis empirically will enable us to make better utilization of the available spectrum and reduce the emissions whenever possible.

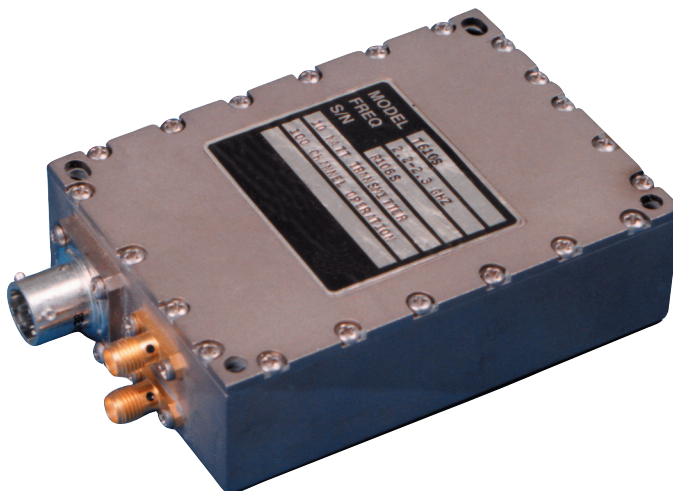
The transmitters are: **(PLEASE, SEE ATTACHMENTS FOR TRANSMITTER SPECS)**

Airborne Telemetry Products Transmitters T-610, (Qty. 2)

Airborne Telemetry Products Transmitters ST-800, (Qty. 2)

Transmitter Information

T-610
S Band Frequency Agile FM Transmitters
Airborne Telemetry Products



- Low S, Upper S, or Full S Band Coverage
- 8.75 Cubic Inches
- 12 Ounces
- Frequency Agile
- 1/2 MHz Steps
- Meets IRIG Turn-On Time
- Optional CCIR-405 Pre-Emphasis



communications

The L-3 Communications Telemetry-East T-610 series UHF transmitters are 8.75 cubic inch frequency agile wideband telemetry transmitters designed for video and high data rate digital modulation requirements. The units are designed to operate in severe aerospace environments encountered in missiles, targets and RPV's.

Frequency is selectable in 0.5 MHz steps over S, HS, or the Full 200 MHz S-Band by input of binary codes from a remote line or by connecting a prewired programming plug to the unit's MDM-15S frequency select connector. An internal PROM translator option enables custom selection codes or BCD thumbwheel inputs without the need for any additional hardware.

A unique PLL control circuit permits 10 Hz modulation response while still meeting IRIG one second turn-on time requirements. Anti-sweep lock detect circuitry prevents RF radiation until the unit has locked on frequency, thereby eliminating the possibility of interference with other RF signals.

RF originates at full frequency rather than a sub-harmonic of the output frequency, thus eliminating low-order spurious signals. This scheme also minimizes part count thereby enhancing transmitter reliability.

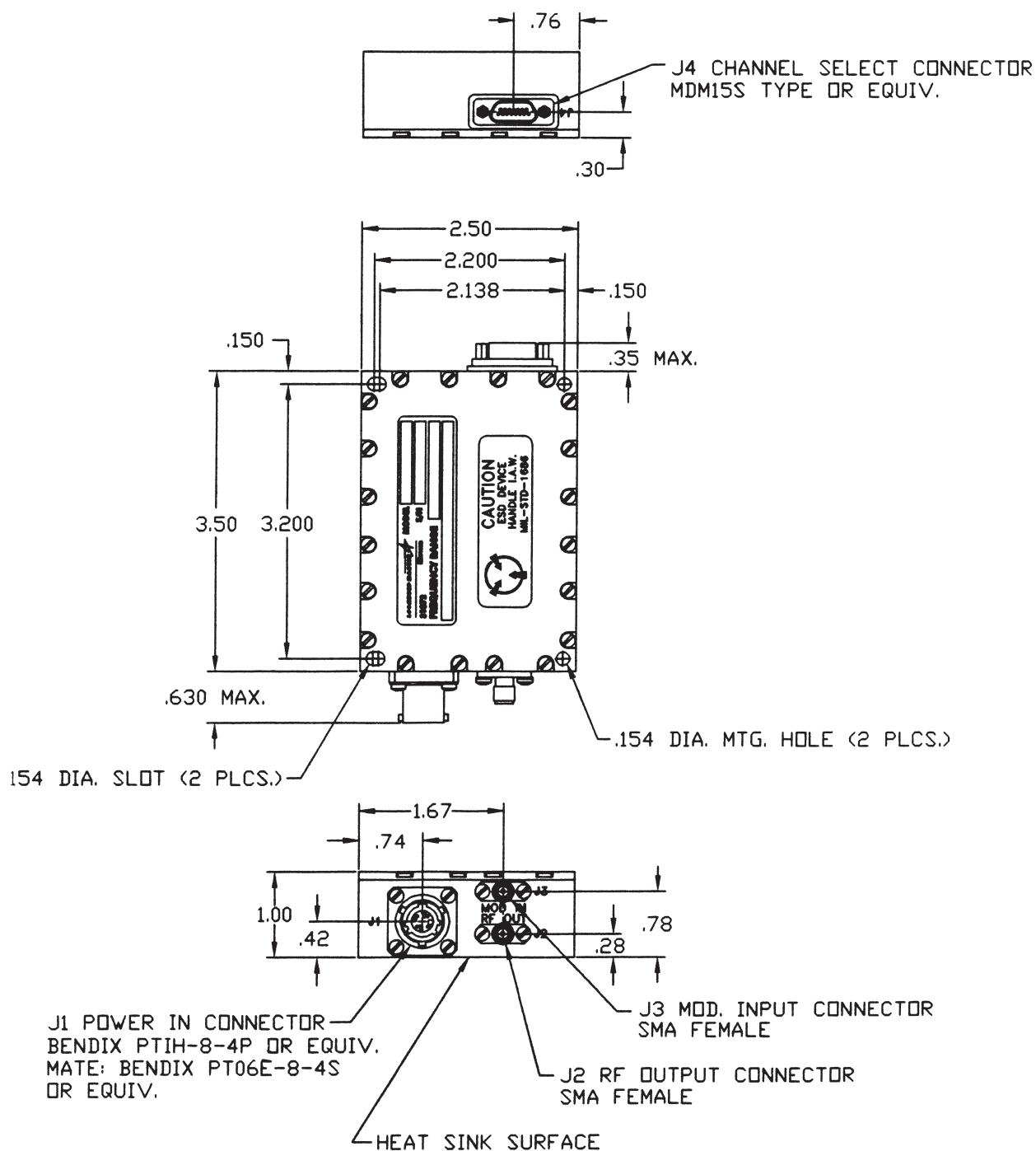
The design accommodates the upgrading of all parts to fully hermetic high-reliability requirements to meet almost any special program needs.

PIN CONNECTIONS

J1	Telemetry (Optional)	Video
A	+28 VDC In	+28 VDC In
B	MOD In	N.C.
C	+28 VDC RTN	+28 VDC RTN
D	MOD RTN (DELETE J3)	N.C.

CHANNEL SELECT CONNECTOR

J4	2200 MHz 2300 MHz	2300 MHz 2400 MHz	2200 MHz 2400 MHz	Step Size
P1	LSB	LSB	LSB	0.5 MHz
P2	—	—	—	1.0 MHz
P3	—	—	—	2.0 MHz
P4	—	—	—	4.0 MHz
P5	—	—	—	8.0 MHz
P6	—	—	—	16.0 MHz
P7	—	—	—	32.0 MHz
P8	MSB	MSB	MSB	64.0 MHz
P9	N.C.	N.C.	N.C.	128.0 MHz
P10-14	N.C.	N.C.	N.C.	—
P15	GND	GND	GND	—



T-610 Mechanical Outline Drawing

SPECIFICATIONS

Output Characteristics

Power Output (min.):	10 watts @ 1.5:1 VSWR
Turn-on Time:	Per IRIG 106-86
Frequency Range (band):	2200-2300 MHz, 2310-2390 MHz and 2200 MHz-2400 MHz
Frequency Selection:	Frequency Agile, 1/2 MHz Steps thru Operating Band. Selection is accomplished by input of binary code via a remote line or a prewired program plug. (See Options)
Frequency Stability:	±0.002%
Output Impedance:	50 ohm nominal
Output Load VSWR:	Isolator Protected

Power Requirements

Voltage:	28 ±4 VDC
Current (max.):	3.5 amp 4.0 amp for the -200
Reverse Polarity:	No Damage from Indefinite Application of -40 VDC
Over Voltage:	+40 VDC, 3 minutes; no damage
Grounding:	Power and Modulation Returns

Modulation Characteristics

Type:	True FM
Sense:	Positive
Input Impedance:	Video = 75 ohm Telemetry = 10k ohm (Other available – specify when ordering)
Frequency Response:	10 Hz to 6 MHz ±1.5 dB (See Options)
Deviation Sensitivity:	User Adjustable, Preset at ±4 MHz/Vp-p ±15% for Video or ±500 kHz/Vrms ±15% for Telemetry (Customer Specified)
Maximum Deviation:	±8 MHz (Consult factory for > ±8 MHz)
Linearity:	2% BSL at 5 MHz Deviation
IFM:	10 kHz peak
IAM:	5% max.
Modulation Distortion:	2% max. at 5 MHz deviation

Environmental

Temperature	
Non-Operating:	-55°C to +100°C
Operating:	-20°C to +70°C Baseplate (See Options)

Vibration	
Random:	20-2000 Hz, 14g rms, 3 axes
Sine:	20-2000 Hz, 20g peak, 3 axes
Shock:	100g, 11 msec, 1/2 sine, 3 axes
Acceleration:	100g, 3 axes
Altitude:	Unlimited
Humidity:	95% RH
EMI:	MIL-STD 461 at 28 VDC, IRIG-106 for Antenna Conducted

Mechanical

Dimensions:	See Outline Drawing
Volume:	8.75 cubic inches
Weight:	12 oz. max.
Connectors:	See Outline Drawing
Pin Connections:	See Outline Drawing

Options (Consult Factory)

Extended Operating Temperature:	-40°C to +85°C
Video Pre-Emphasis:	CCIR-405
Higher Efficiency:	Consult Factory
Extended Frequency Response:	12 MHz (Consult Factory for >12 MHz)
Other Modulation Sensitivity:	Consult Factory
Modulation Return Isolation:	Consult Factory

Frequency Select:	Internal PROM selection by BCD or custom digital codes. DIP switch in lieu of J4
Modulation Input Connector:	SSMA or Modulation input on J1& deletion of J3
Reduced Operating Voltage:	22 VDC Low Line min. for 10 Watt min. output power
RF Output Connector	TNC Female

Specify When Ordering:

Model Number/Frequency Bands:	
T-610S	- 2200 MHz - 2300 MHz
T-610HS	- 2310 MHz - 2390 MHz
T-610S-200	- 2200 MHz - 2400 MHz

Frequency Selection:	Standard Binary, Internal PROM Translator or DIP switch
Modulation Input Impedance:	75 ohm or 10k ohm
Modulation Sensitivity:	Per Customer Requirement
Other Options:	(See Options)



Airborne Telemetry

ST-800 Series Wideband Telemetry Microwave Transmitters *Airborne Telemetry Products*



FEATURES

- Minimum Size and Weight
- Available in 2, 5, and 10 Watts Minimum Power Output
- 2200 to 2400 MHz and 1435 to 1534 MHz Frequency Range
- Wide Modulation Bandwidth Capabilities
- Meets latest IRIG-106 Standards
- Crystal Controlled Center Frequency

DESCRIPTION

The L-3 Communications Telemetry-East ST-800 S/L Series Microwave transmitters are designed for operation in aerospace environments where size and weight efficiency are critical. The ST-800 S/L Series are solid-state, crystal stabilized, true FM telemetry transmitters designed for transmitting wideband digital multiplex signals, video, TTL, differential TTL, and fully isolated (Opto-Coupled). These transmitters are designed for extremely reliable operation when subjected to the severe environmental flight conditions of missiles, space vehicles and aircraft.

The internal modules (modulator, series regulator, power amplifier, and filters) are housed in separate machined enclosures to maximize RF isolation. All units undergo rigorous environmental testing to insure reliable operation while meeting the specification requirements under worse case conditions.



communications
Telemetry & RF Products

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ELECTRICAL SPECIFICATIONS

Frequency Range: E/S-Band 2200 to 2300 MHz
E/S-Band 2300 to 2400 MHz
D/L-Band 1435 to 1534 MHz

Frequency Selection: The output frequency is selectable in 1 MHz steps over the desired frequency, with optional frequency selection available in 0.5 MHz and 0.25 MHz steps. Frequency is selected by input of binary code via a remote line.

Frequency Stability: $\pm 0.002\%$

Power Output: ST-802 S/L 2 Watts min.
ST-805 S/L 5 Watts min.
ST-810 S/L 10 Watts min.

Antenna Compatibility

Output Impedance: 50 ohms

VSWR (load): up to infinite to one

Open/Short Protection: Yes, Internal Isolation

Modulation

Type: True FM

Sense: Positive

Input Impedance: 75 ohm nominal, with 30 pF shunt capacitance max. (10K ohm min, with 30 pF shunt capacitance available)

Frequency Response: 10 Hz to 6 MHz ± 1.5 dB (Response in excess of 10 MHz available). Video PreEmphasis (CCIR 405) optional

Deviation: 6 MHz peak

Deviation Sensitivity: 6 MHz/V rms ($\pm 10\%$ STD for 100 MHz BW)

Deviation Linearity: 2.0% at ± 6 MHz deviation

Input Power

Voltage: 28 ± 4 Vdc
Current: ST-802 S/L 0.8 A max
ST-805 S/L 1.5 A max (w/ALC)
ST-805 S/L 1.8 A max
ST-810 S/L 3.3 A max

Reverse Polarity Protection: Yes

Power Return: Power return common to case

Over Voltage Protection: Yes

ENVIRONMENTAL SPECIFICATIONS

All performance specifications will be met under the following conditions.

Temperature: -20°C to +70°C
(-40°C to +85°C available)

Vibration: Sine 20g from 20 to 2000 Hz, 3 axis

Shock: 100g, 1/2 sine, 11 msec

Acceleration: 100g

Altitude: Unlimited

MECHANICAL SPECIFICATIONS

Dimensions: 2" x 3" x 0.80" excluding connections*

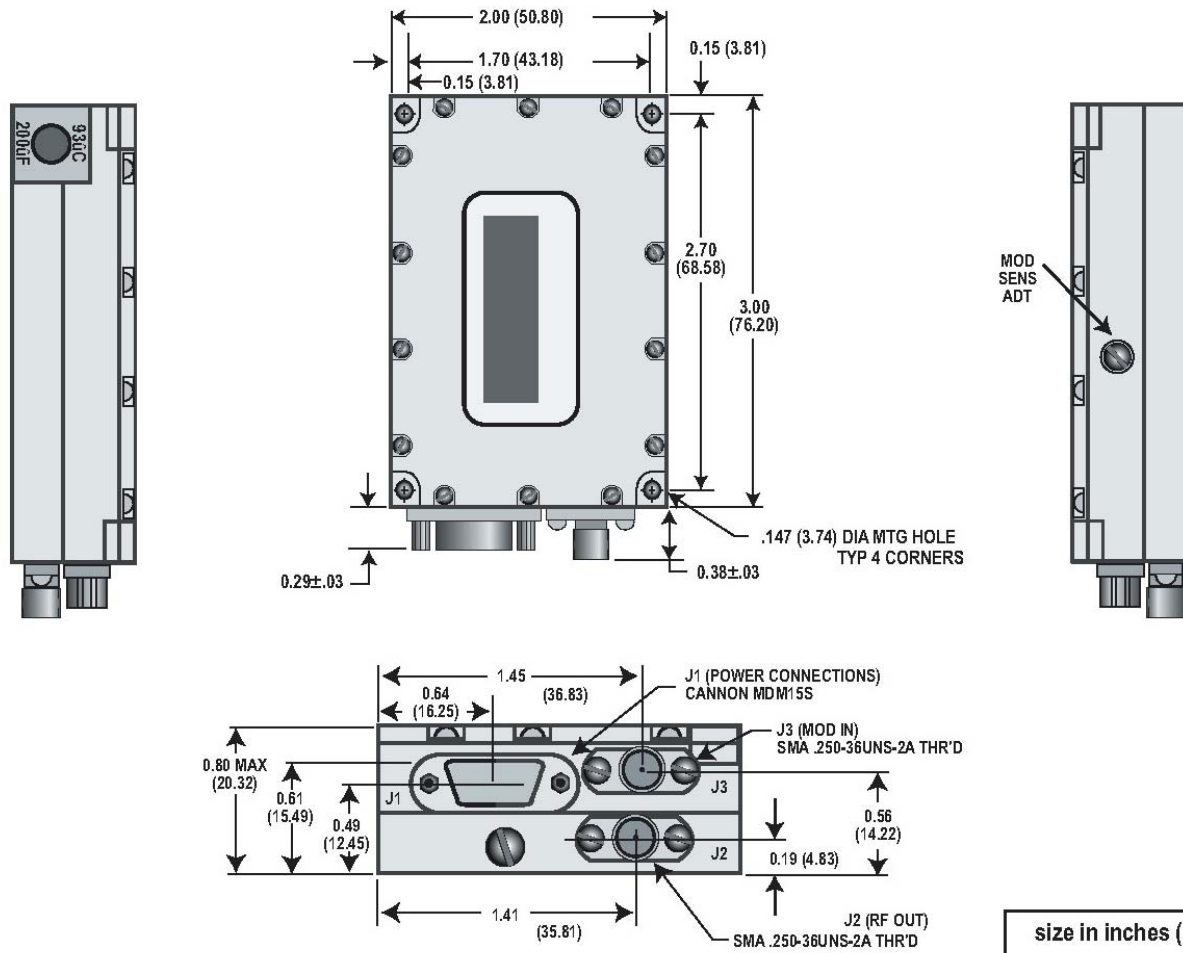
Weight: 7 ounces max

Volume: 4.8 Cu. Inches

Mounting: 6-32 screws, 4 corners

Connectors:
J-1 Power MDM-15S
Pin Connections 1 through 8 Freq. Selection
9-PWR RTN
10- SPARE
11- SPARE
12- SPARE
13- +28V
14- PWR RTN
15- PWR RTN
J-2 RF Output SMA Female
J-3 Modulation Input SMA Female

ST-800 S/L Series Outline Drawing



OPTIONS*

- Input Impedance
- Field Adjustable Deviation Sensitivity
- Deviation Sensitivity
- Extended Temperature Range
- Modulation Input on Power connector
- Other DC and RF Connectors Available
- Data rates to beyond 20 Mbits/sec with wider deviations and extended bandwidth
- Pre-emphasis for Video Transmission
- Remote Power On/Off Control
- 200 MHz Bandwidth at S Band

***NOTE: Options may include additional costs**

QUALITY CONTROL and PRODUCT ASSURANCE

The L-3 Communications Telemetry-East ST-800 S/L Series transmitters are manufactured under strict Control procedures in accordance with the requirements of ISO 9001 and MIL-Q 9858. Each assembled unit is fully tested to a comprehensive acceptance test procedure which includes full performance testing at thermal extremes.

ORDERING INFORMATION

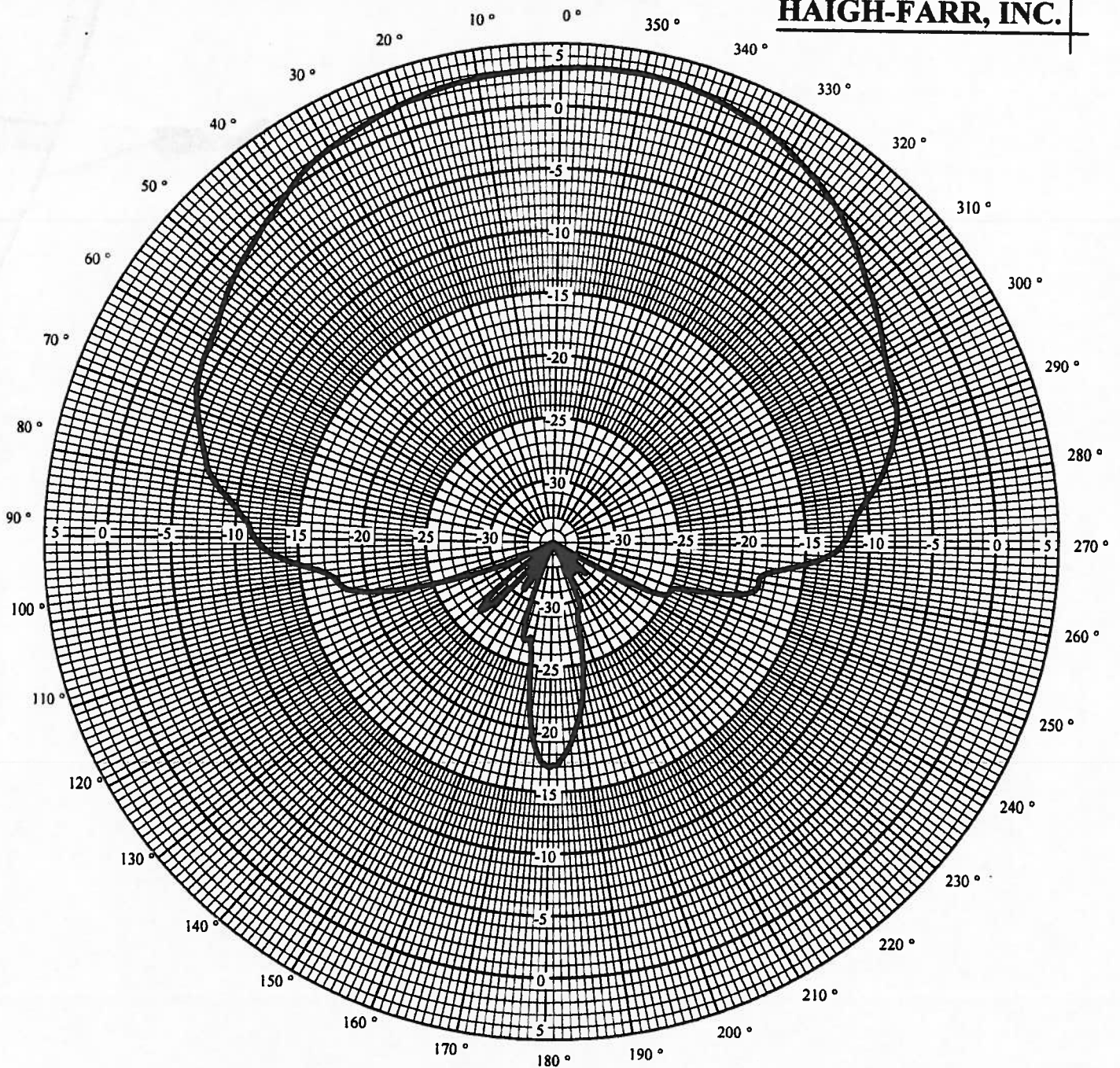
When ordering, specify model number and exact operating frequency in megahertz. For special applications or additional information, contact the L-3 Communications Telemetry-East Sales Department in Bristol, PA or your L-3 Communications Telemetry-East sales representative.

1515 Grundy's Lane
Bristol, PA 19007
1-267-545-7000
Fax: 267-545-0100

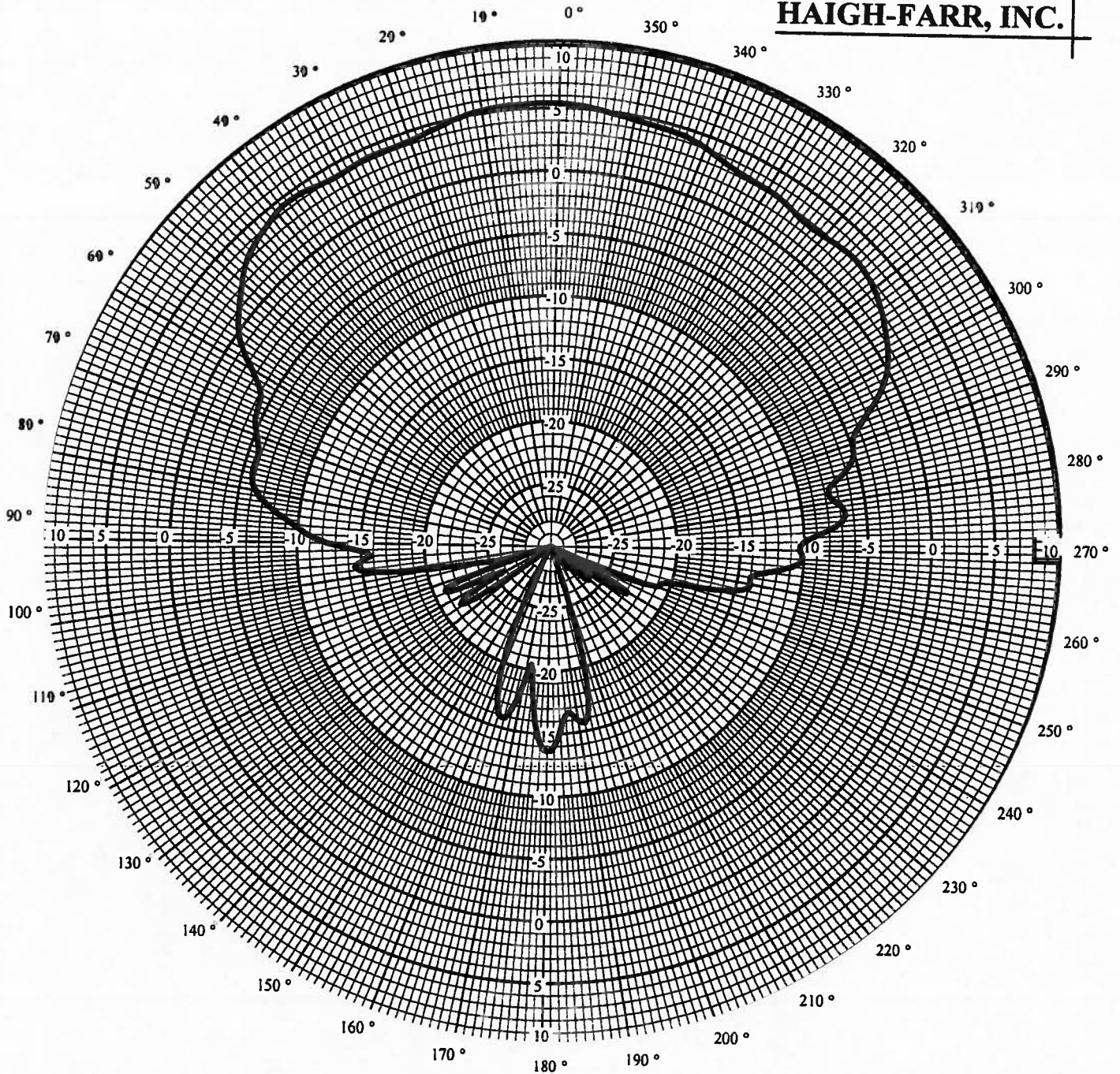
www.L-3Com.com/te



Antenna Information



MODEL: 72735000	FREQ	VSWR	FREQ	1435 MHz	θ	90°
TECHNICIAN: T.B.			ISO	0	ϕ	VAR
COMMENTS: Pre-Enviromental			DATE 19MAR09		SERIAL	4



MODEL: 72735000	FREQ	VSWR	FREQ	2200 MHz	θ	90°
TECHNICIAN: T.B.			ISO	0	ϕ	VAR
COMMENTS: Pre-Enviromental			DATE 19MAR09		SERIAL	4

FCC Information

**FCC FORM 442 - FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR NEW OR MODIFIED RADIO STATION UNDER PART 5 OF FCC RULES -
EXPERIMENTAL RADIO SERVICE (OTHER THAN BROADCAST)**

**Approved by
OMB
3060 - 0065
Expires
09/30/98**

Applicant's Name (company): L-3 Communication, Coleman Aerospace

File No.: 0582-EX-PL-2014

Mailing Address

Attention: Roberto Soto
Street Address: 7675 Municipal Drive
P.O. Box:
City: Orlando
State: FL
Country:
Zip Code: 32819
E-Mail Address: roberto.soto@l-3com.com

Application Purpose

Application is for: NEW LICENSE

For Modification indicate below

File No.: **Callsign:**

Government Contract

Is this authorization to be used for fulfilling the requirement of a government contract with an agency of the United States Government? If "YES", include as an exhibit a narrative statement describing the government project, agency and contract number. Yes

Foreign Government Use

Is this authorization to be used for the exclusive purpose of developing radio equipment for export to be employed by stations under the jurisdiction of a foreign government? If "YES", include the contract number and the name of the foreign government concerned as an exhibit. No

Research Project

Is this authorization to be used for providing communications essential to a research project? (The radio communication is not the objective of the research project)? If "YES", include as an exhibit the following information:

- a. A description of the nature of the research project being conducted.
- b. A showing that the communications facilities requested are necessary for the research project involved.
- c. A showing that existing communications facilities are inadequate.

No

Exhibit Information

If all the answers to Items 4, 5, 6 are "NO", include as an exhibit a narrative statement describing in detail the following items:

- The complete program of research and experimentation proposed including description of equipment and theory of operation.
- The specific objectives sought to be accomplished.
- How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion or utilization of the radio art, or is along line not already investigated.

Estimated Duration

Give an estimate of the length of time that will be required to complete the program of experimentation proposed in this application: 24 Months

Environmental Impact

Would a commission grant of this application come within Section 1.1307 of the FCC Rules, such that it may have a significant environmental impact? If "YES", include as an exhibit an Environmental Assessment as required by Section 1.1311. No

Manufacturer

List below transmitting equipment to be installed (if experimental, so state) if additional rows are required, please submit equipment list as an exhibit :

Manufacturer	Model Number	No. Of Units	Experimental
Airborne Telemetry Products	T-610	2	No
Airborne Telemetry Products	ST-800	2	No

Station ID

Is the equipment listed in Item 10 capable of station identification pursuant to Section 5.115? No

Applicant Type

Applicant is: Corporation

Foreign Government

Is applicant a foreign government or a representative of a foreign government? No

License Denied or Revoked

Has applicant or any party to this application had any FCC station license or permit revoked or any application for permit, license or renewal denied by this Commission?

If "YES", include as an exhibit a statement giving call sign of license or permit revoked and relate circumstances. No

Owner and Operator

Will applicant be owner and operator of the station? Yes

Contact Information

Give the following information of person who can best handle inquiries pertaining to this application: **First Name:**

Roberto

Last Name: Soto

Title: System Safety Engineer

Phone Number: 407-226-7935

E-Mail Address: roberto.soto@l-3com.com

Drug Abuse Question

APPLICANT ANTI-DRUG ABUSE CERTIFICATION: By checking "YES", the individual applicant certifies that he or she is eligible for this license. This requires that he or she is not subject to a denial of federal benefits, including FCC benefits, as a result of a drug offense conviction pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862. A non-individual applicant, e.g., corporation, partnership or other unincorporated association, certifies that no party to the application is subject to a denial of federal benefits, pursuant to that section. For definition of a "party" for these purposes, see 47CFR 1.2002(b). Yes

Certification**THE APPLICANT CERTIFIES THAT:**

- a. Copies of the FCC Rule Parts 2 and 5 are on hand; and
- b. Adequate financial appropriations have been made to carry on the program of experimentation which will be conducted by qualified personnel; and
- c. All operations will be on an experimental basis in accordance with Part 5 and other applicable rules, and will be conducted in such a manner and at such a time as to preclude harmful interference to any authorized station; and
- d. Grant of the authorization requested herein will not be construed as a finding on the part of the Commission:
 - 1. that the frequencies and other technical parameters specified in the authorization are the best suited for the proposed program of experimentation, and
 - 2. that the applicant will be authorized to operate on any basis other than experimental, and
 - 3. that the Commission is obligated by the results of the experimental program to make provision in its rules including its table of frequency allocations for applicant's type of operation on a regularly licensed basis.

THE APPLICANT FURTHER CERTIFIES THAT:

- e. All the statements in the application and attached exhibits are true, complete and correct to the best of the applicant's knowledge; and
- f. The applicant is willing to finance and conduct the experimental program with full knowledge and understanding of the above limitations; and
- g. The applicant waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the USA.

Name of Applicant: L-3 Communication, Coleman Aerospace

Signature (Authorized person filing form): Roberto Soto

Signature Date (Authorized person filing form): 07/31/2014

Title of Person Signing Application: System Safety Engineer

Classification: Office of applicant corporation or association

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(A)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

NOTIFICATION TO INDIVIDUALS UNDER PRIVACY ACT OF 1974 AND THE PAPERWORK REDUCTION ACT OF 1980

Information requested through this form is authorized by the Communications Act of 1934, as amended, and specified by Section 308 therein. The information will be used by Federal Communications Commission staff to determine eligibility for issuing authorizations in the use of the frequency spectrum and to effect the provisions of regulatory responsibilities rendered by the Commission by the Act. Information requested by this form will be available to the public unless otherwise requested pursuant to 47 CFR 0.459 of the FCC Rules and Regulations. Your response is required to obtain this authorization.

Public reporting burden for this collection of information is estimated to average four (4) hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to the Federal Communications Commission, Records Management Branch, Paperwork Reduction Project (3060-0065), Washington DC 20554. DO NOT send completed applications to this address. Individuals are not required to respond to this collection unless it displays a currently valid OMD control number.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3), AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507.

Station Location

City State Latitude Longitude Mobile Street (or other indication of location) County Radius of Operation
0 North West Orlando FL

Datum: NAD 83

Is a directional antenna (other than radar) used? Yes

Exhibit submitted: No

(a) Width of beam in degrees at the half-power point: 45.00

(b) Orientation in horizontal plane: 90.00

(c) Orientation in vertical plane: 90.00

Will the antenna extend more than 6 meters above the ground, or if mounted on an existing building, will it extend more than 6 meters above the building, or will the proposed antenna be mounted on an existing structure other than a building? No

(a) Overall height above ground to tip of antenna in meters:

(b) Elevation of ground at antenna site above mean sea level in meters:

(c) Distance to nearest aircraft landing area in kilometers:

(d) List any natural formations of existing man-made structures (hills, trees, water tanks, towers, etc.) which, in the opinion of the applicant, would tend to shield the antenna from aircraft:

Action	Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New	2214.50000000-2276.50000000 MHz	MO	10.000000 W 20.000000 W	P		11M6F7D	PCM-FM or SOQPSK

City	State	Latitude	Longitude	Mobile	Street (or other indication of location)	County	Radius of Operation
0		North	West	Orlando FL			

Datum: NAD 83

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Action	Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New	1455.50000000-1476.50000000 MHz	MO	10.000000 W 20.000000 W	P		11M6F7D	PCM-FM or SOQPSK

City	State	Latitude	Longitude	Mobile	Street (or other indication of location)	County	Radius of Operation
0	Orlando FL	Florida	North	West	Orlando FL	ORANGE	

Datum: NAD 83

**Online Payment****Step 3: Confirm Payment****1 | 2 | 3****Thank you.****Your transaction has been successfully completed.****Pay.gov Tracking Information****Application Name:** Remittance Advice**Pay.gov Tracking ID:** 25H0DGSV**Agency Tracking ID:** PGC2547009**Transaction Date and Time:** 08/06/2014 08:09 EDT**Payment Summary****Address Information****Account Holder Name:** Roberto Soto

8138 White

Billing Address: Pelican St**Billing Address 2:****City:** WInter Garden**State / Province:** FL**Zip / Postal Code:** 34787**Country:** USA**Account Information****Card Type:** American Express**Card Number:** *****4004**Payment Information****Payment Amount:** \$65.00**Transaction Date and Time:** 08/06/2014 08:09 EDT

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FCC Registration

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FRN Registration

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Thank you for registering with the FCC. As of today, **Jul 31 2014 9:08AM**, you have been assigned the following FCC Registration Number (FRN): **0023838147**. Please print this page for your records.

Domestic Business Registration

Business Type: Private Sector Subtype: Corporation

Business Name: L-3 Communications, Coleman Aerospace

EIN: 581912899

Contact Information

Organization: Position: System Safety Engineer

Salutation: First Name: Roberto

Middle Initial: Last Name: Soto

Suffix:

Address Line 1: 7675 Municipal Drive

Address Line 2:

City: Orlando

State: FLORIDA

Zip Code: 32819

Phone: 407 354 0047 ext. 7635

Fax:

Email: roberto.soto@l-3com.com

Personal Security Question

PSQ: Corporate internal employee ID

To better secure your personal information, the FCC no longer displays your Password or Personal Security Answer.

Amateurs, Aircraft, Marine, Antenna Structure Registration (ASR), and any other service licensed through the Universal Licensing System (ULS) should click on the following link to access ULS and associate their call sign(s) with their new FRN and password. Existing call signs must be associated with an FRN before you can file in ULS.

- [Universal Licensing System](#)

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