EXHIBIT D

USER MANUAL

2.983(d)(8)

EM RESEARCH, INC.

2465 HIGHWAY 40, PO BOX 1247 VERDI, NEVADA 89439
Phone: (702) 345-2411 FAX: (702) 345-1030

TECHNICAL INSTRUCTION MANUAL

Interrogation Transmitter 870-00004
EM Part # EMPA-1030-400-04

EM Research, Inc. Proprietary

M. Eiting 4/28/98
file:ckc698

I) Introduction

The system Interrogation Transmitter (ANPC P/N 870-00004) EM P/N EMPA-1030-400-04 is a subsystem within Advanced Navigation and Positioning Corporations Transponder landing System (TLS). It is used within the landing system to transmit the pulse modulated interrogation signals. Because of the avionics nature of this transmitter, installation and maintenance are strictly controlled by the Advanced Navigation & Positioning Corporation (ANPC) and the FAA. This transmitter is a custom and proprietary unit sold only to ANPC.

Due to the special nature of this product there is no user manual. However the following steps and procedures are covered in ANPC's Technical Instruction Manual and the Installation Instructions for the Transponder Landing System.

II) Description

The Interrogation transmitter is part of the TLS base station unit. This is a prefabricated, temperature controlled, secure enclosure that contains the uninterruptable power supply, base central processing units, interrogation transmitter, network panel, and maintenance interface unit. All of these units are located in two standard 19" equipment racks within the station shelter.

The Interrogation transmitter is controlled by the base central processing unit (Base CPU) via a digital interface. The transmitter rf output is fed via a coax cable to the interrogation antenna. The transmitter is a 19" rack unit with positive forced air cooling

III) Front Panel Indicators & Rear Panel I/O

The following switches and indicators are on the front panel.

a) AC power on/off
b) AC input circuit breaker
c) Overduty reset
d) overduty indication light

The following connectors are located on the back panel.

a) AC power entry module.
b) BNC Jack-female for 1030 MHz sample, 1 volt peak to peak signal.
c) N connector for 400 Watts pulsed rf at 1030 MHz.
d) Ring lock connector for digital I/O from the Base CPU.

IV) Power Up Procedure

Note: All of the following functions will be performed by qualified Technicians and Engineers as designated by ANPC. The power up sequence is outlined in detail by ANPC as the interrogation transmitter is one of several units in the system.

1) Make sure that the front panel AC switch is in the off position.

2) Connect the rear panel RF connection to the interrogation antenna coax. The transmitter is internally protected against any high VSWR at the RF output.

3) Connect to the J1 ringlock connector the I/O cable from the Base CPU.

4) Connect the rear panel AC power. Insure that the AC voltage displayed on the AC power entry module matches the AC line voltage used.

5) Turn front panel AC power on. If AC power is correctly applied the front panel AC switch will be illuminated.

The power down procedure is the reverse order of the power up procedure starting with turning off the front panel AC power switch.

IV) Operating and Troubleshooting

Note: All troubleshooting and maintenance must be performed by EM Research, Inc. personnel or ANPC personnel.

Under normal operating conditions the transmitter will transmit rf pulses at 1030 MHz and an output power of 400 watts, pulse timing and duration are controlled by the Base CPU.

If an abnormal pulse condition is detected the internal overduty circuitry will shut down the transmitter, inhibiting any further rf pulses from being transmitted. If this occurs the front panel overduty light will turn on, indicating a fault. In order to reset the transmitter after an overduty condition the front panel reset button must be manually pressed and released. If the indicator goes out the transmitter is functioning properly, if the indicator remains lit, the fault condition still exists.

The rear panel RF sample output is used by the Base CPU to monitor signal integrity including rf pulse amplitude, pulse width, and pulse frequency. Included in the rear panel J1 I/O connector and monitored by the Base CPU are additional built in test lines, they are as follows;

Overduty Line. J1 pin# N : This line is logic high on an overduty condition, after front panel reset and overduty condition corrected this line will go low.

Transmitter OK. J1 pin# L: Logic high indicates power and DC voltages are correctly applied to the transmitter.

Lock Indicator. J1 pin# c: A logic high on this line indicates the internal 1030 MHz rf source is operating correctly and frequency locked to the internal 10 MHz crystal reference.

If any of the above indicators can not be reset to normal operating conditions by either power cycle or corrected inputs from the Base CPU. then the Transmitter must be returned to ANPC or EM Research, Inc. for factory repair.

EXHIBIT E

PARTS LIST/TUNE UP INFO

2.983(d)(9)

2.983(d)(9) Question: Tune-up procedure over the power range, or at specific operating power levels.

Customer will provide by the end of this week (8/28).

FCC ID: XXXEMPAL

CKC LABORATORIES, INC. Testing the Future

EXHIBIT E

SYSTEM MANUAL

5473A CLOUDS REST • MARIPOSA, CALIFORNIA 95338 • (209) 966-5240 • FAX (209) 966-4257

May 4, 1998

Federal Communications Commission
Equipment Approval Services
P.O. Box 358315
Pittsburgh, PA 15251-5315

To Whom It May Concern:

The FCC statement was not included with the manual. I emailed Charlie Cobb regarding the statement. I was not sure if Part 15.19(a)(1) would apply and was unable to find any statement in Part 2 or Part 87. I will send an update of the manual if a statement is needed.

Sincerely,

Monika Lopez

Technical Writer

EM RESEARCH, INC.

2465 HIGHWAY 40, PO BOX 1247 VERDI, NEVADA 89439
Phone: (702) 345-2411 FAX: (702) 345-1030

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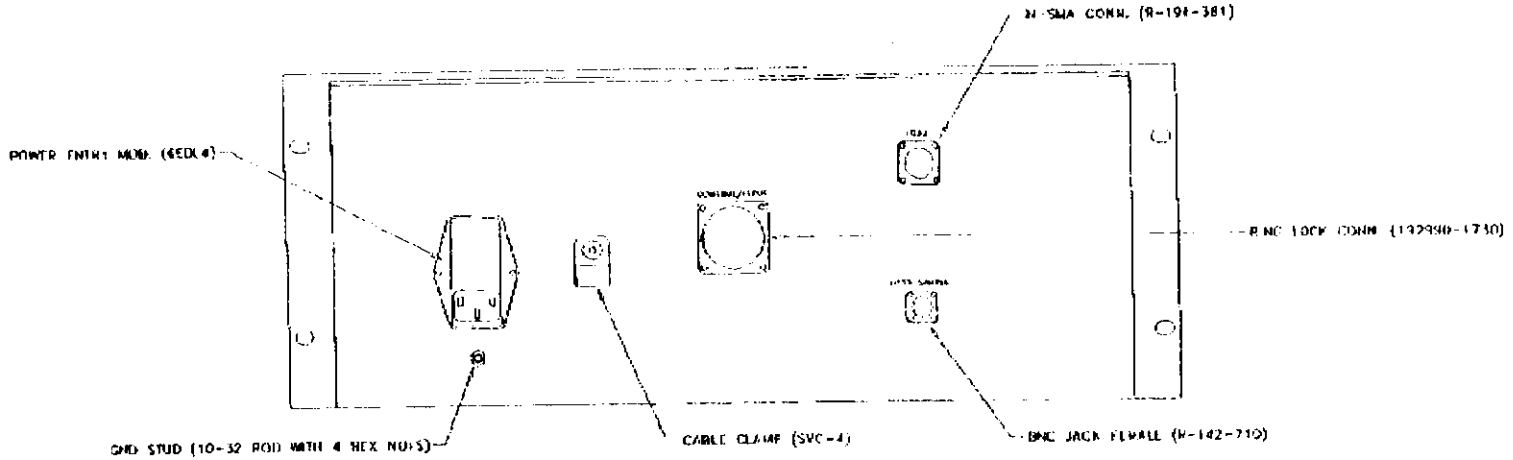
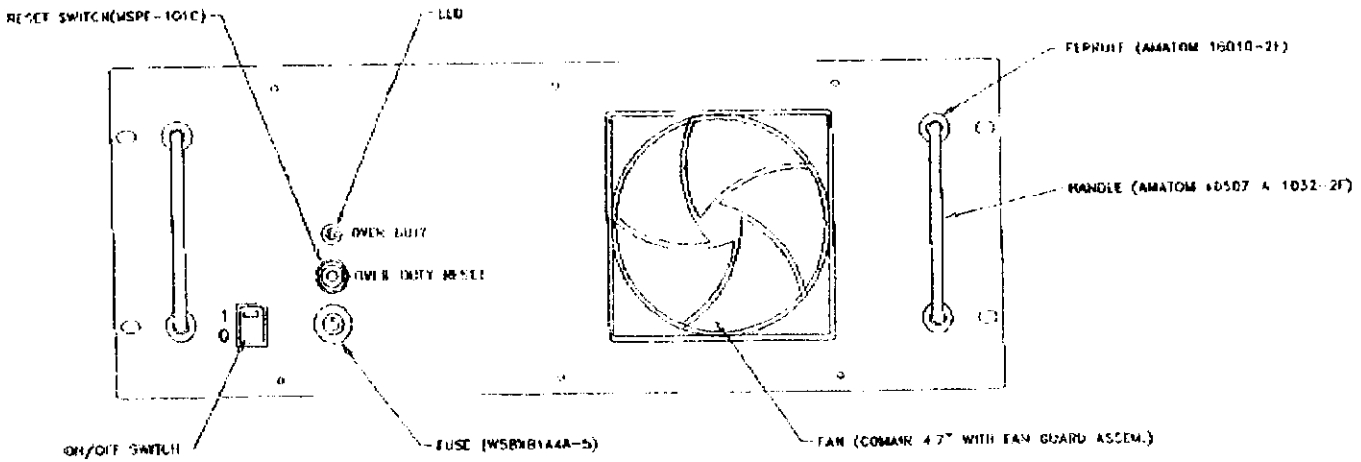
REVISIONS		
1	INITIAL RELEASE	
	DWC	19 Jan-98





DATE 1/19/98	REV A	EM RESEARCH Inc. P.O BOX 1747, 2465 HIGHWAY 60, VERDI, NV 89439 702 345-2411	
DWN DWC	JOB # 1675		
CC	ENGR DWG	ASSEMBLY PRINTS FRONT & REAR PANELS.	
FILE 1675\BOX\PNL-ASSM			
SIZE	SCALE	PART NO.	SHEET

UNLESS OTHERWISE NOTED:
ALL DIMENSIONS ARE IN INCHES
ALTERNATE DIMS [mm]

TOLERANCE:
.X +/- .06[1.5]
.XX +/- .02[.50]
.XXX +/- .005[.125]