

**CONFIDENTIAL**

U. S. NAVAL AIR STATION  
PATUXENT RIVER, MARYLAND

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1944 AUG 24 AM 10 44

21 August 1944

42-1/7/TBEM-1C  
Proj. TED No. PTR-31638.0  
Dist. pa (RT) 1387

Chief of the Bureau of Aeronautics.

TBM-1C - Flight Test of C131/AR Yardeny Automatic Selector Mechanism.

(a) BuAer ltr. Aer-E-3113-JHH; F42-1/65, Ser. No. 130910, dated 26 July 1944.

1. In accordance with reference (a), flight tests were made to determine usability of the Yardeny spot tuner attached to the AN/ARC-5 receiver, selecting receiver channels with the AN/ART-13 transmitter channels.

2. Results of the flight tests are submitted as enclosure (1).

By direction of the Commanding Officer.



G. M. GREENE,  
Comdr., U.S.N.,  
Radio Test Officer.

Encl. (HW)

1. Conf. Flight Test notes, including (1) drawing and (2) photos.

SECTION A - PROJECT #638.0FLIGHT TEST NOTES OF C131/AR YARDENY AUTOMATIC  
SELECTOR MECHANISM

1. The R-26/ARC-5 H.F. receiver with the C131/AR Yardeny spot tuner attached was received and cabled according to the wiring diagram furnished by BuAer. The unit was then bench tested together with an AN/ART-13 transmitter.

During this test it was found that the operator lacked means of modulating the transmitter and that severe hunting existed in the Yardeny unit. This was due to an incomplete wiring diagram. Subsequently, the spot tuner was returned to the Naval Research Laboratory for adjustment in compliance with orders from the cognizant officer.

Following the return of the unit, new cabling was constructed in accordance with modified wiring diagram (R.T.Dwg. D-246). The equipment operated satisfactorily with this change.

2. (a) Subject equipment was installed in TBM-1C airplane, #45656, as shown in photographs PTR #11847, and PTR #11848. The Yardeny spot tuner installation was made in lieu of the standard R26/ARC-5 locally controlled unit.

(b) Subject equipment was tuned and the spot tuner adjusted by first tuning each channel of the AN/ART-13 transmitter to a frequency, as shown in table (a) below, and after checking against an LM-10 frequency meter the receiver was tuned to the transmitter carrier.

TABLE (a) - FREQUENCIES EMPLOYED

| <u>Channel</u> | <u>AN/ART-13<br/>Transmitter</u> | <u>AN/ARC-5<br/>Receiver R-26</u> |
|----------------|----------------------------------|-----------------------------------|
| 1              | 3105 kc                          | 3105 kc                           |
| 2              | 4525                             | 4525                              |
| 3              | 4495                             | 4495                              |
| 4              | 3005                             | 3005                              |
| 5              | 5295                             | 5295                              |
| 6              | 3385                             | 3385                              |
| 7              | 6210                             | Blank                             |
| 8              | 7535                             | Blank                             |
| 9              | 6390                             | Blank                             |
| 10             | 6630                             | Blank                             |

Enclosure (1)

During the period 4-15 August, 1944, the equipment was flight tested in a TBM-1C airplane. After violent maneuvers and a dozen rough landings and take-offs, all channels were checked with the LM-10 Frequency Meter and found to be properly tuned to frequency. Tests were performed with the special transmitter/receiver Control Box in the forward and rear cockpits with satisfactory results.

#### RECOMMENDATIONS.

(a) It is recommended that provision be made on the special transmitter/receiver Remote Control Box (as provided by BuAer) to provide for ON/OFF control of the R-26/ARC-5 and WAAE-13 equipments, an emission selection switch, a channel selector switch, and a microphone jack.

(b) It is recommended that installations be made allowing sufficient space at the front of the Yardeny Spot Tuner to afford manual tuning operations of the receiver in event of failure of the selector mechanism.

(c) It is recommended that a delay in starting the receiver cycle (2½ seconds for complete cycle) until completion of the transmitter cycle (25 seconds for complete cycle) be incorporated.

(d) It is recommended that power (28 v.) for the Yardeny Spot Tuner unit be controlled by the R-26/ARC-5 ON/OFF switch. In this way the Spot Tuner mechanism will not be energized with the receiver in the OFF position.

(e) It is recommended that the receiver selector circuit be rewired in order to have the receiver return to a particular one of six spot frequencies when the Remote Control Box selects a transmitter channel above the receiver range (channel 7,8,9, or 10). Under the present arrangement, when the transmitting channels above #6 are selected, the Yardeny Spot Tuner is deenergized. When the electrical circuit in the Yardeny Spot Tuner unit is deenergized, the motor stops in any random receiver setting after it loses its momentum. This renders the receiver useless.

The following modification to the special pilot's transmitter/receiver Control Box is suggested as a means of causing the receiver to return to a designated tuned channel when a transmitter channel of #7,8,9, or 10 is selected. Solder a jumper across terminals 7,8,9, or 10 on the two decks of the ten contact switch. Connect to the terminal controlling the receiver channel desired for the standby receiver frequency while the transmitter is operating above the range of the R-26/ARC-5 receiver.

On 11 and 15 August, 1944, the installation was inspected and tested by BuAer representatives. The equipment operated satisfactory except as noted above.

SPECIAL CONTROL  
BOX

AN/ART-13

TEST LOCAL REPEAT CHANNEL NUMBER L. FREQ. T. CALIBRATE OPERATE

REPLACE THIS PANEL WITH BOM-1 OSCILLATOR FOR OPERATION BELOW 1000 KC.

ANTENNA LOADING ANTENNA TUNING SER. 1900 - A HIGH FREQUENCY TUNING

INSTRUCTIONS FOR PRECISION TUNING:  
1. SET LOCAL OSC. WHEEL AT LOCAL WAVELENGTH.  
2. SET CHANNEL NUMBER, CHANNEL NUMBER AT LOCAL WAVELENGTH.  
3. SET LOCAL OSC. WHEEL AT LOCAL WAVELENGTH.  
4. SET CHANNEL NUMBER, CHANNEL NUMBER AT LOCAL WAVELENGTH.  
5. SET LOCAL OSC. WHEEL AT LOCAL WAVELENGTH.  
6. SET CHANNEL NUMBER, CHANNEL NUMBER AT LOCAL WAVELENGTH.

SET KNOBS ACCURATELY

ARM MASTER SIGNAL FLASH

REACT MANUAL ON

TRASH AUTO OFF

COMPARTMENT LIT

POWER

MAINTENANCE

8 7 6 5 4 3 2 1 0

TEMP. °C

AN/ART-13 Transmitter and  
Special AM/ART-13 AN/ARC-5  
Control Box Installed in TBM-1C #45656

PTR-11847  
8-5-44  
RESTRICTED

OFFICIAL NAVY PHOTOGRAPH  
NOT TO BE USED  
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BOMB DOOR  
CONTROL  
PUSH TO CLOSE  
PULL TO OPEN

CAUTION  
WALL MOUNTED  
DO NOT REMOVE  
WALL MOUNTING BRACKET  
OR REMOVE FROM WALL

1. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
2. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
3. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
4. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
5. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
6. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
7. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
8. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
9. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.  
10. WHEN CARRYING ON FUELING, SET STATION NUMBER ON POSITION No. 1.

YARDENY SPOT  
TUNER C131/AR

Yardeny Spot Tuner and  
R-26/ARC-5 Installed in  
TBM-1C Airplane #45656.

PTR-11848  
8-5-44  
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