# *TB 9-4920-358-24

**DEPARTMENT OF THE ARMY TECHNICAL BULLETIN**

# CALIBRATION PROCEDURE FOR TRANSPONDER SET, TEST SET AN/APM-378

Headquarters, Department of the Army, Washington, DC
28 May 2008



**REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS**

You can improve this manual. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also send in your comments electronically to our E-mail address: 2028@redstone.army.mil or by fax 256-842-6546/DSN 788-6546. For the World Wide Web use: https://amcom2028.redstone.army.mil. Instructions for sending an electronic 2028 can be found at the back of this manual.



*This bulletin supersedes TB 9-4920-358-35, dated 27 February 2006, including all changes.

## SECTION I
## IDENTIFICATION AND DESCRIPTION

**1. Test Instrument Identification**. This bulletin provides instructions for the calibration of Transponder Set, Test Set, AN/APM-378. TM 11-4920-296-14&P was used as the prime data source in compiling these instructions. The equipment being calibrated will be referred to as the TI (test instrument) throughout this bulletin.

**a. Model Variations**. None.

**b. Time and Technique**. The time required for this calibration is approximately 4 hours, using the microwave technique.

**2. Forms, Records, and Reports**

**a**. Forms, records, and reports required for calibration personnel at all levels are prescribed by TB 750-25.

**b**. Adjustments to be reported are designated (R) at the end of the sentence in which they appear. When adjustments are in tables, the (R) follows the designated adjustment. Report only those adjustments made and designated with (R).

**3. Calibration Description**. TI parameters and performance specifications which pertain to this calibration are listed in table 1.

Table 1. Calibration Description

| Test instrument parameters | Performance specifications ±(percent of reading plus digits) |
|---|---|
| Receiver | Sensitivity: -6 dBm ±1 dB<br>Bandwidth: 7.0 ±1 MHz (-3 dB points)<br>Frequency: 1090 MHz ±0.5 MHz<br>Interrogation rate: 257 ±5 Hz |
| Transmitter | Power: -6 dBm ±1 dB<br>Frequency: 1030 ±0.2 MHz<br>Pulse width: 0.7 to 0.9 µs<br>Pulse spacing: MODE<br>1 3 ±0.2 µs<br>2 5 ±0.2 µs<br>3/A 8 ±0.2 µs<br>C 21 ±0.2 µs<br>Test 6.5 ±0.2 µs |

Table 1. Calibration Description - Continued

| Test instrument parameters | Performance specifications ±(percent of reading plus digits) |
|---|---|
| MODE 4 | Pretrigger amplitude: ≥ 1.5 V; pulse width: 1.0 to 2.0 µs<br>Interrogation video amplitude:<br>(TTL level) Low ≤ 0.3 V, High ≥ 2.4 V;<br>Pulse width: 0.3 to 0.7 µs |
| Receiver reference code, emergency and I/P | Proper ACCEPT/REJECT operation |
| Power supply | TP1 to chassis ground: 0.0 ±50 mV dc<br>TP2 to TP1: +12.0 ±0.5 V dc<br>TP3 to TP1: +5.0 ±0.25 V dc |

## SECTION II
## EQUIPMENT REQUIREMENTS

**4. Equipment Required**. Table 2 identifies the specific equipment to be used in this calibration procedure. This equipment is issued with Secondary Transfer Calibration Standards Set AN/GSM-286; AN/GSM-287; or AN/GSM-705. Alternate items may be used by the calibrating activity. The items selected must be verified to perform satisfactorily prior to use and must bear evidence of current calibration. The equipment must meet or exceed the minimum use specifications listed in table 2. The accuracies listed in table 2 provide a four-to-one ratio between the standard and TI. Where the four-to-one ratio cannot be met, the actual accuracy of the equipment selected is shown in parenthesis.

**5. Accessories Required**. The accessories required for this calibration are common usage accessories, issued as indicated in **4** above, and are not listed in this calibration procedure. The following peculiar accessory is also required for this calibration: Circulator, P/N 7916840 (5985-01-217-0286).

Table 2. Minimum Specifications of Equipment Required

| Common name | Minimum use specifications | Manufacturer and model (part number) |
|---|---|---|
| MULTIMETER | Range: 0 to 12 V dc<br>Accuracy: ±1% | Fluke, Model 8840A/AF05 (AN/GSM-64D) |
| PEAK POWER METER | Range: 0 to -10 dBm<br>Accuracy: ±0.25 dBm | Wavetek, Model 8502A (8502A) w/power detector, Wavetek, Model 16934 (16934) |
| RADAR TEST SET | Input:<br>Frequency: 1030 ± 0.05 MHz<br>Power level: 0 to -10 dBm<br>Received pulse range: 0 to 3907 ms<br>Accuracy: ±3%<br>Output:<br>Frequency: 1080 to 1100 MHz<br>Accuracy: ±0.01%<br>Pulse source, range: 0 to 1 µs<br>Power level: 0 to -10 dBm<br>Oscilloscope:<br>Timebase: 0.1 µs to 4 ms ±0.01%<br>Amplitude: 0 to 5 V dc ±3% | (AN/UPM-155) |

## SECTION III
## CALIBRATION PROCESS

### 6. Preliminary Instructions

**a**. The instructions outlined in paragraphs **6** and **7** are preparatory to the calibration process. Personnel should become familiar with the entire bulletin before beginning the calibration.

**b**. Items of equipment used in this procedure are referenced within the text by common name as listed in table 2.

**c**. Unless otherwise specified, verify the result of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manual for this TI.

**d**. When indications specified in paragraphs **8** through **17** are not within tolerance, perform the power supply check prior to making adjustments. After adjustments are made, repeat paragraphs **8** through **17**. Do not perform power supply checks if all other parameters are within tolerance.

**e**. Unless otherwise specified, all control and control settings refer to the TI.

### 7. Equipment Setup

**WARNING**

HIGH VOLTAGE is used or exposed during the performance of this calibration. DEATH ON CONTACT may result if personnel fail to observe safety precautions. REDUCE OUTPUT(S) to minimum after each step within the performance check where applicable.

**NOTE**

Do not operate TI with ANTENNA unloaded. When required, use a 50 Ω termination; do not use a feedthrough.

**a**. Remove front panel and chassis assembly from case.

**b**. Set TI switches as listed in (1) through (4) below.

(1) **MODE** switch to **2**.

(2) **REFERENCE CODE** switches to **7700**.

(3) **FUNCTION** switch to **SYSTEM**.

(4) **SYSTEM TYPE** switch to **SINGLE CHANNEL**.

**c**. Connect 115 V ac or 28 V dc power source to TI and set appropriate **POWER** switch to **ON**.

**d**. Allow 30 second warm-up, then set **TEST** switch to **ON**. **REJECT** lamp will light.

**e**. Set **FUNCTION** switch to **LAMP TEST** position. All front panel lamps will light.

**f**. Set **FUNCTION** switch to **SELF TEST** position.

**g**. Rotate **MODE** switch throughout all positions. **ACCEPT** lamp will light for each mode checked.

**h**. Set **MODE** switch to any position and set **TEST** switch to **MOM**. **ACCEPT** lamp will light.

**i**. Set **FUNCTION** switch to **SYSTEM**. **REJECT** lamp will light.

**NOTE**

Only settings listed are necessary for the measurement. Other settings do not affect the measurement.

**j.** Set TI **MODE** switch to **2** and **TEST** switch to **ON**.

**k.** Connect equipment as shown in figure 1.

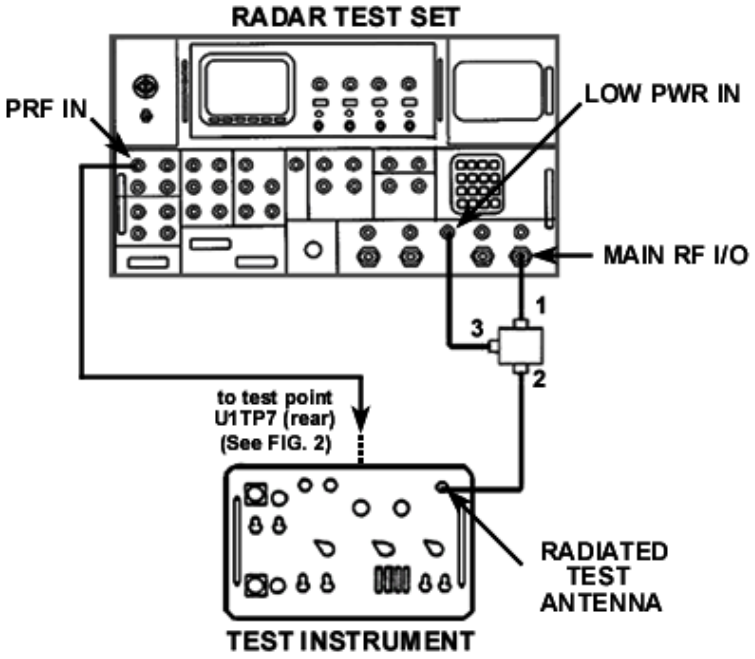



Figure 1. Receiver sensitivity – equipment setup.

**l**. Initialize radar test set by selecting **FUNCTION** and **ENTER**. Set radar test set **INTERROGATOR** menus as listed below:

(1) **Menu 3** - **M2** to **7700**, **RANGE DELAY** to **0 μs**, **SIF2** to **OFF**.

(2) **Menu 14** - **PRF** to **257 PPS**, **0 TRIG** to **INTERNAL.**

(3) **Menu 16** - **SOURCE** to **LOW POWER**, **RF** to **- 0**.

**m.** Select radar test set **Menu 16**, **POWER**, and **ENTER** to perform measurement sequence. When power reading is displayed, press up or down arrow to stop measurement. TI **ACCEPT** lamp will be lit.

**8. Receiver Sensitivity**

**a. Performance Check**

(1) Note radar test set **PRF** indication on **Menu 16** (lower left hand corner of display screen). PRF reading will be between 252 and 262 PPS.

(2) Adjust radar test set **Menu 16** RF output to obtain an **ACCEPT/REJECT** threshold indication on TI (switch over point from **ACCEPT/REJECT**). Record radar test set output dBm readings.

**NOTE**

At **Menu 14** on radar test set, **0 TRIGGER** may have to be cycled from internal to external to obtain an **ACCEPT** light.

(3) Remove cable from TI **RADIATED TEST ANTENNA** connector (fig. 1) and connect end of cable to peak power meter sensor.

(4) On radar test set **Menu 11**, set **CW** to **ON** and measure and record power output at end of cable while cycling RF output between power settings noted in (2) above for threshold point. Average result should be -6 dBm ± 1 dB, if not perform **b** below.

(5) Set radar test set **Menu 11**, **CW** to **OFF**. Disconnect cable from peak power sensor and reconnect to the TI **RADIATED TEST ANTENNA** connector (fig. 1).

**b. Adjustments**

**CAUTION**

Use care to prevent the RF module from dropping out of TI when positioning and adjusting TI.

(1) Set TI **POWER** switch to **OFF** and remove the housing from the RF MODULE (fig. 2) as listed in (a) through (c) below.

(a) Disconnect the three RF cables from side of RF MODULE (fig. 2).

(b) Release the two hold-downs at opposite corners of module and gently lift RF MODULE (fig. 2) A1 from its connector.

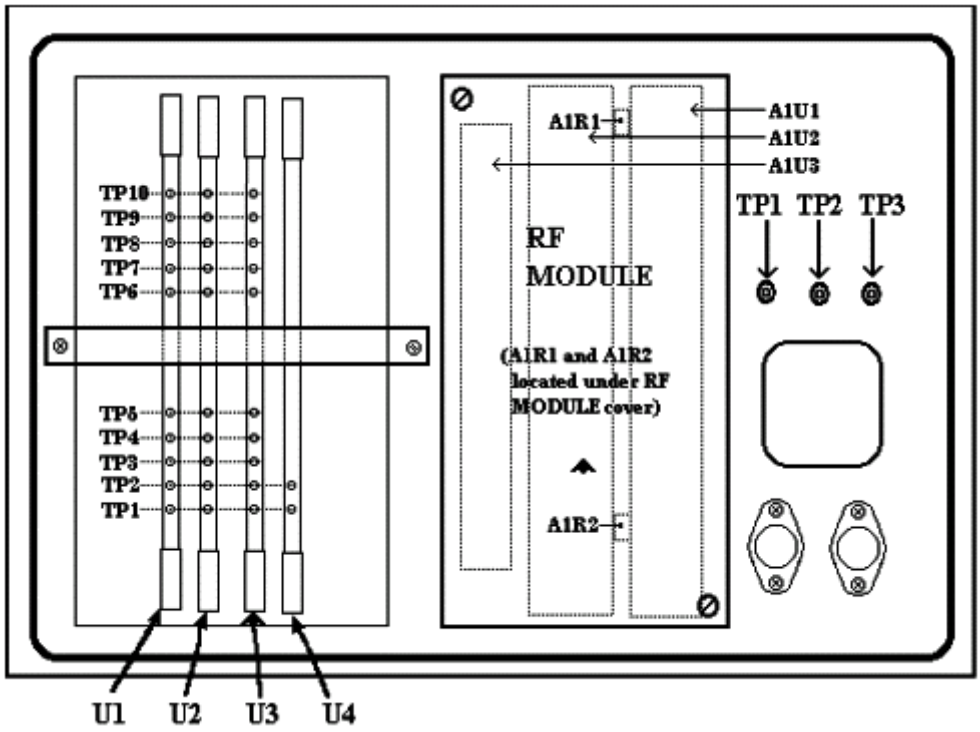



Figure 2. Test instrument – rear view.

(c) Replace RF MODULE (fig. 2) into its chassis assembly and reconnect the three RF cables.

(2) Set TI **POWER** switch to **ON**.

(3) Connect end of cable which was connected to TI **RADIATED TEST ANTENNA** connector (fig. 1) to peak power meter sensor.

(4) On radar test set **Menu 11**, set **CW** to **ON** and adjust RF power to obtain a reading of -6 dBm on peak power meter.

(5) Set radar test set **Menu 11**, **CW** to **OFF**. Disconnect cable from peak power sensor and reconnect to the TI **RADIATED TEST ANTENNA** connector (fig. 1).

(6) Adjust A1R1 (fig. 2) until **ACCEPT/REJECT** indicator just changes from **REJECT** to **ACCEPT** (R).

**9. Receiver Frequency and Bandwidth**

**a. Performance Check**

(1) Set TI **SYSTEM TYPE** switch to **LOBING**.

(2) On radar test set, select **Menu 16** and increase RF output 3 dB from threshold point noted in **8 a** (4) above. Select **POWER** and **ENTER** to perform a power measurement sequence, then press up or down arrow keys to stop the measurement.

(3) On radar test set, select **Menu 10** and increase radar test set main output frequency until TI **REJECT** lamp comes on. Decrease frequency until TI **ACCEPT** lamp just lights. Record frequency.

(4) Decrease radar test set main output frequency until TI **REJECT** lamp comes on, then increase frequency until **TI ACCEPT** lamp just lights. Record frequency.

(5) Subtract lower frequency recorded in (4) above from upper frequency recorded in (4) above. Bandwidth will be between 6 and 8 MHz.

(6) Compute center frequency by adding the frequencies recorded in (4) and (5) above and dividing by 2. Center frequency will be between 1089.5 and 1090.5 MHz.

**b. Adjustments.** No adjustments can be made.

**10. Receiver Reference Code, Emergency and I/P Function Operation**

**a. Performance Check**

(1) Set TI **SYSTEM TYPE** switch to **SINGLE CHANNEL**.

(2) Initialize radar test set by selecting **FUNCTION** and **ENTER**. Set radar test set **INTERROGATOR** menus as listed below:

(a) **Menu 3 - M1** through **MC REPLY CODES** to **7700, RANGE DELAY** to **0 μs, SIF2** to **OFF**.

(b) **Menu 4 - SIF CODE** to **7700, DELAY** to **3 μs, TRIG SOURCE** to **EXTERN+**.

(c) **Menu 14 - PRF** to **257 PPS, 0 TRIG** to **INTERNAL**.

(d) **Menu 16 - SOURCE** to **LOW PWR,** and **RF** to **- 0**.

(3) Select radar test set **Menu 16**, **POWER**, and **ENTER** to perform measurement sequence. Press up or down arrow to stop measurement.

(4) Set TI **REFERENCE CODE** pushbuttons and radar test set **REPLIES SIF CODE** in turn to settings listed in table 3, and observe the correct **ACCEPT** or **REJECT** indications as listed.

Table 3. Receiver Reference Code

| Test instrument **REFERENCE CODE** | Radar test set **M2 REPLIES SIF REPLY CODE** (menu 3) | **REJECT** or **ACCEPT** conditions |
|---|---|---|
| 7700 | 1111 | REJECT |
| 1111 | 1111 | ACCEPT |
| 1111 | 2222 | REJECT |
| 2222 | 2222 | ACCEPT |
| 2222 | 3333 | REJECT |
| 3333 | 3333 | ACCEPT |
| 4444 | 3333 | REJECT |
| 4444 | 4444 | ACCEPT |

Table 3. Receiver Reference Code - Continued

| Test instrument **REFERENCE CODE** | Radar test set **M2 REPLIES SIF REPLY CODE** (menu 3) | **REJECT** or **ACCEPT** conditions |
|---|---|---|
| 5555 | 4444 | REJECT |
| 5555 | 5555 | ACCEPT |
| 6666 | 5555 | REJECT |
| 6666 | 6666 | ACCEPT |
| 7777 | 6666 | REJECT |
| 7777 | 7777 | ACCEPT |

(5) Set TI and radar test set switches to settings listed in table 4, and observe the correct **ACCEPT** or **REJECT** indications as listed.

Table 4. Emergency and I/P Function

| Test instrument | | | Radar test set | **REJECT** or **ACCEPT** condition |
|---|---|---|---|---|
| **FUNCTION** | **MODE** | **REFERENCE CODE** | **REPLY SIGNAL** (menu 3) | |
| EMER[1,2] | 1 | 7700 | VAR EMG | ACCEPT |
| EMER | 2 | 7700 | VAR EMG | ACCEPT |
| EMER | 3/A | 7700 | VAR EMG | ACCEPT |
| EMER | C | 7700 | VAR EMG | REJECT |
| EMER | C | 7700 | SIF | ACCEPT |
| EMER | 3/A | 7700 | SIF | REJECT |
| EMER | 2 | 7700 | SIF | REJECT |
| EMER | 1 | 7700 | SIF | REJECT |
| I/P[3] | 2 | 7777 | ID of POS | ACCEPT |
| I/P | 3/A | 7777 | ID of POS | ACCEPT |
| I/P | C | 7777 | ID of POS | ACCEPT |
| I/P | C | 7777 | SIF | ACCEPT |
| I/P | 3/A | 7777 | SIF | REJECT |
| I/P | 2 | 7777 | SIF | REJECT |
| I/P | 1 | 7777 | SIF | REJECT |

[1] Set radar test set **Menu 3** - **M1** through **MC REPLY CODES** to **7700**.

[2] Perform transmitter output power check if emergency mode 1 step produces a flickering of accept light.

[3] Set radar test set **Menu 3** - **M1** through **MC REPLY CODES** to **7777**.

**b. Adjustments.** No adjustments can be made.

## 11. Transmitter Power

### a. Performance Check

(1) Set TI switches as listed in (a) through (d) below:

(a) **MODE** switch to **2**.
(b) **REFERENCE CODE** switches to **7700**.
(c) **FUNCTION** switch to **FREQ/POWER**.
(d) **SYSTEM TYPE** switch to **SINGLE CHANNEL**.

(2) Connect peak power meter to TI **RADIATED TEST ANTENNA** connector.

(3) Measure pulse power output of TI. If measured output power is not between -5 and -7 dBm, perform **b** below.

**b. Adjustments**. Adjust A1R2 (fig. 2) until power meter indicates -6 dBm. Reinstall RF module cover (R).

**12. Transmitter Frequency**

**a. Performance Check**

**NOTE**

RF module cover must be in place for the following checks.

(1) Connect equipment as shown in figure 3.

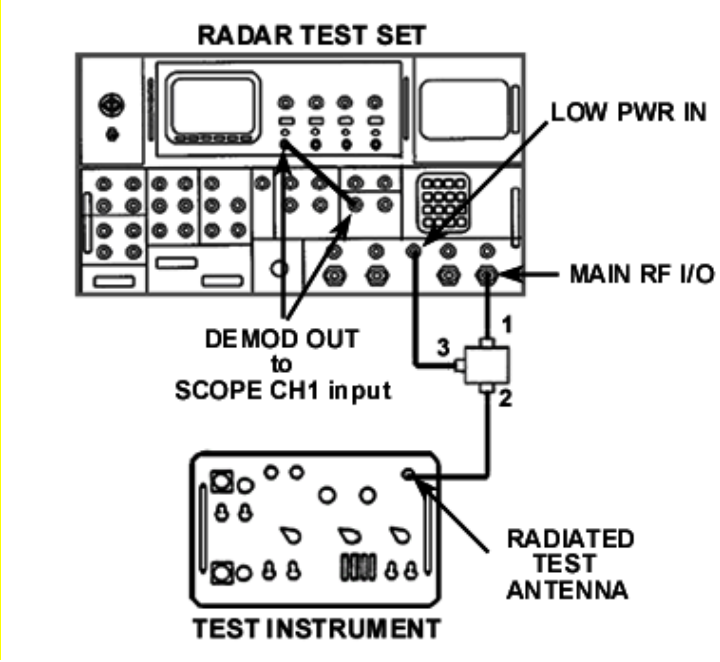



Figure 3. Transmitter frequency/pulse – equipment setup.

(2) Set TI switches as listed in (a) through (d) below:

(a) **MODE** switch to **2**.
(b) **REFERENCE CODE** switches to **7700**.
(c) **FUNCTION** switch to **SYSTEM**.
(d) **SYSTEM TYPE** switch to **SINGLE CHANNEL.**

(3) Initialize radar test set by selecting **FUNCTION** and **ENTER**. Set radar test set **INTERROGATOR** menus as listed below:

(a) **Menu 3** - **M2** to **7700**, **RANGE DELAY** to **0 μs**, **SIF2** to **OFF**.
(b) **Menu 4** - **SIF CODE** to **7700**, **DELAY** to **3 μs**, **TRIG SOURCE** to **EXTERN+**.

(c) **Menu 11** - **MODULATION** to **OFF.**
(d) **Menu 14** - **PRF** to **257 PPS**, **0 TRIG** to **INTERNAL**.
(e) **Menu 16** - **SOURCE** to **LOW PWR**, **RF** to **- 0**.

(4) On **Menu 16** on radar test set, highlight **FREQUENCY** and press **ENTER** to start frequency measurement. Test may take up to 15-20 minutes.

(5) Radar test set frequency measurement will indicate TI output frequency between 1029.8 and 1030.2 MHz.

**b. Adjustments.** No adjustments can be made.

**13. Transmitter Pulse**

**a. Performance Check**

(1) Connect equipment as shown in figure 3.

(2) Set TI switches as listed in (a) through (d) below:

(a) **MODE** switch to **2**.
(b) **REFERENCE CODE** switches to **7700**.
(c) **FUNCTION** switch to **FREQ/POWER**.
(d) **SYSTEM TYPE** switch to **SINGLE CHANNEL**.

(3) Select radar test set **Menu 11**, **MODULATION** to **ON**. Set TI **MODE** switch to **1**, **2**, **3/A**, and **C**, and adjust oscilloscope to observe presence of complete interrogation pulse trains (see fig. 4), making sure that TI **ACCEPT** lamp is lit in each mode.

(4) Set TI **MODE** switch to **1**.

(5) Set oscilloscope for a convenient display of the first 3 pulses of the interrogation pulse train.

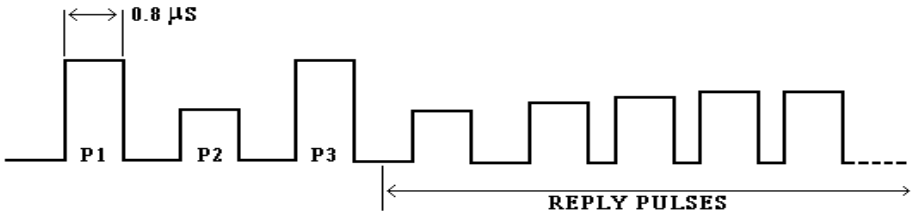



Figure 4. Pulse train (example).

(6) Measure the pulse width of P1 and P3 pulses. Pulse width will be between 0.7 and 0.9 µs.

(7) Initialize radar test set by selecting **FUNCTION** and **ENTER**. Set radar test set **INTERROGATOR** menus as listed below:

(a) **Menu 3** - **M2** to **7700**, **RANGE DELAY** to **0 µs**, **SIF2** to **OFF**.

(b) **Menu 4** - **SIF CODE** to **7700**, **DELAY** to **3 µs**, **TRIG SOURCE** to **EXTERN+**.

(c) **Menu 14** - **PRF** to **257 PPS**, **0 TRIG** to **INTERNAL**.

(d) **Menu 16** - **SOURCE** to **LOW PWR**, **RF** to **- 0**.

(8) Select radar test set **Menu 16**, **POWER**, and **ENTER** to perform power measurement sequence. Press up or down arrow to stop measurement. TI **ACCEPT** lamp should be **ON**.

(9) Hold TI **SLS** switch in the **MOM** position, then select **Menu 16**, **SPACING** and take reading of pulse spacing. Spacing will be between 1.85 and 2.15 μs. Release **SLS** toggle switch from **MOM** position. Spacing will be between 2.8 and 3.2 μs.

(10) Set TI **MODE** switch to **2**. Spacing will be between 4.8 and 5.2 μs.

(11) Set TI **MODE** switch to **3/A**. Spacing will be between 7.8 and 8.2 μs.

(12) Set TI **MODE** switch to **C**. Spacing will be between 20.8 and 21.2 μs.

(13) Set TI **MODE** switch to **TEST**. Spacing will be between 6.3 and 6.7 μs.

**b. Adjustments.** No adjustments can be made.

**14. MODE 4 Pretrigger**

**a. Performance Check**

(1) Connect equipment as shown in figure 5.

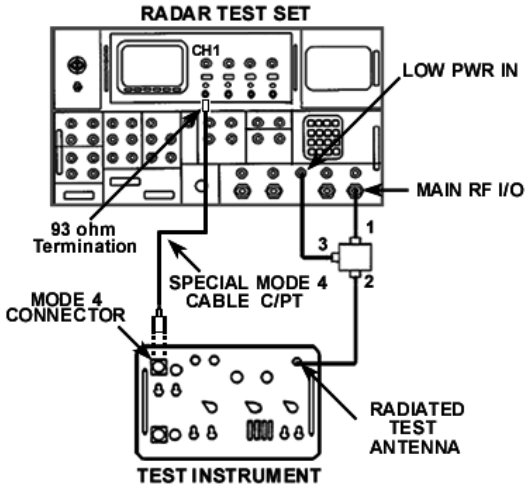



Figure 5. MODE 4 pretrigger – equipment setup.

**NOTE**

If special MODE 4 cable is not available, refer to table 5 and figure 6 for connection of suitable coaxial test leads.

Table 5. Mode 4 Connector Pin Out

| MODE 4 cable | MODE 4 connector | |
|---|---|---|
| | Signal pin | Ground pin |
| C/PT | C | D |
| C/SL | c | d |
| E | E | F |
| J | J | K |

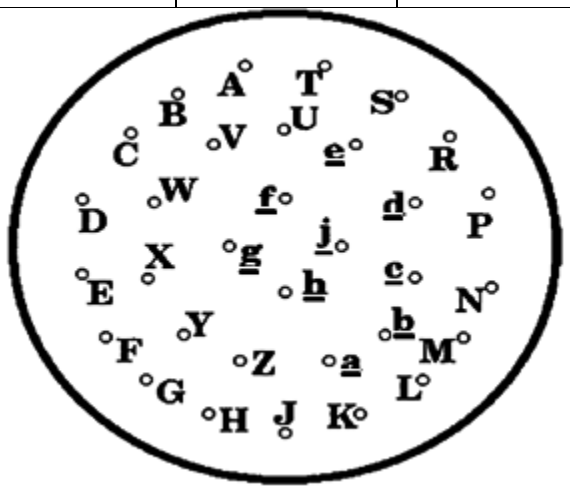



Figure 6. MODE 4 connector pin out.

(2) Position TI controls as listed in (a) through (d) below.

(a) **FUNCTION** switch to **SYSTEM**.

(b) **SYSTEM TYPE** switch to **SINGLE CHANNEL**.

(c) **MODE** switch to **4**.

(d) **TEST** switch to **ON**.

(3) Trigger oscilloscope from **CH 1** and set time per division to **1 μS**.

(4) Measure amplitude of **MODE 4** pretrigger pulse. Amplitude will be ≥ 1.5 V.

(5) Measure pulse width of **MODE 4** pretrigger pulse. Pulse width will be between 1.0 and 2.0 μS.

**b. Adjustments.** No adjustments can be made.

**15. MODE 4 Interrogation Video**

**a. Performance Check**

(1) Connect equipment as shown in figure 7.

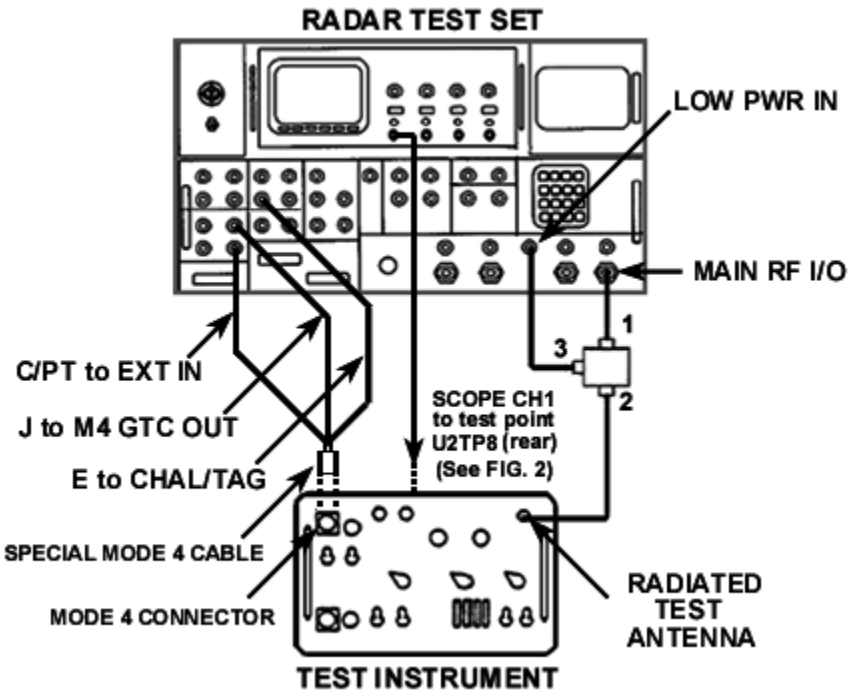



Figure 7. MODE 4 interrogation video - equipment setup.

(2) Initialize radar test set by selecting **FUNCTION** and **ENTER**. Set radar test set **INTERROGATOR** menus as listed below:

(a) **Menu 2** - **M4: WORD C**, **S1** through **S4** to **ON**, **S5** to **OFF**.

(b) **Menu 3** - **REPLY SIGNAL** to **MODE 4-3**, **M1** through **MC OFF**, **RANGE DELAY 1 μS**, **CHAL SOURCE** to **INTERNAL, F2 to OFF**.

(c) **Menu 4** - **REPLY SIGNAL** to **MODE 4-3**.

(d) **Menu 16** - **SOURCE** to **LOW PWR**, **RF** to **- 0**.

(3) Observe **ACCEPT** indication on the TI.

(4) Observe pulse train on oscilloscope **CH1**. There will be 37 pulses with the 5th pulse missing (suppressed).

(5) Measure the first four pulses of the pulse train. The amplitude HIGH level (TTL) must be ≥ 2.4V and LOW level (TTL) must be ≤ 0.3V. Pulse width must be between 0.3 and 0.7 μs.

**b. Adjustments.** No adjustments can be made.

**16. MODE 4 System Accept/Reject**

**a. Performance Check**

(1) Connect equipment as shown in figure 7 except move oscilloscope **CH1** connection from U2TP8 to U3TP9 (fig. 2) on TI and connect oscilloscope **CH2** to radar test set **IFF VIDEO OUT FIRST REPLY**.

(2) Initialize radar test set by selecting **FUNCTION** and **ENTER**. Set radar test set **INTERROGATOR** menus as listed below:

(a) **Menu 2** - **M4: WORD C**, **S1** through **S4** to **ON**, **S5** to **OFF**.

(b) **Menu 3** - **REPLY SIGNAL** to **MODE 4-3**, **M1** through **MC OFF**, **RANGE DELAY 10 μS**, **CHAL SOURCE** to **INTERNAL**, **F2** to **OFF**.

(c) **Menu 4** - **REPLY SIGNAL** to **MODE 4-3**, **2ND REPLY DELAY** to **0 μsec**.

(d) **Menu 16** - **SOURCE** to **LOW PWR**, **RF** to **- 0**.

(3) Observe **ACCEPT** indication on the TI.

(4) Measure pulse width of **GTC** gate on **CH1**. Pulse width will be between 71 and 86 μsec.

(5) Observe three-pulse reply on oscilloscope **CH2**. On radar test set **Menu 3**, increase and decrease **RANGE DELAY** as necessary to shift **CH2** three-pulse reply out of range of the GTC gate pulse on **CH1**. Observe that TI **REJECT** lamp goes **ON** when the three-pulse display on **CH2** moves beyond the beginning and end of the **CH1** pulse waveform.

**b. Adjustments.** No adjustments can be made.

**17. MODE 4 SLS Pulse**

**NOTE**

If special MODE 4 cable is not available, refer to table 5 and figure 7 for connection of suitable coaxial test leads.

**a. Performance Check**

(1) Connect equipment as shown in figure 8.

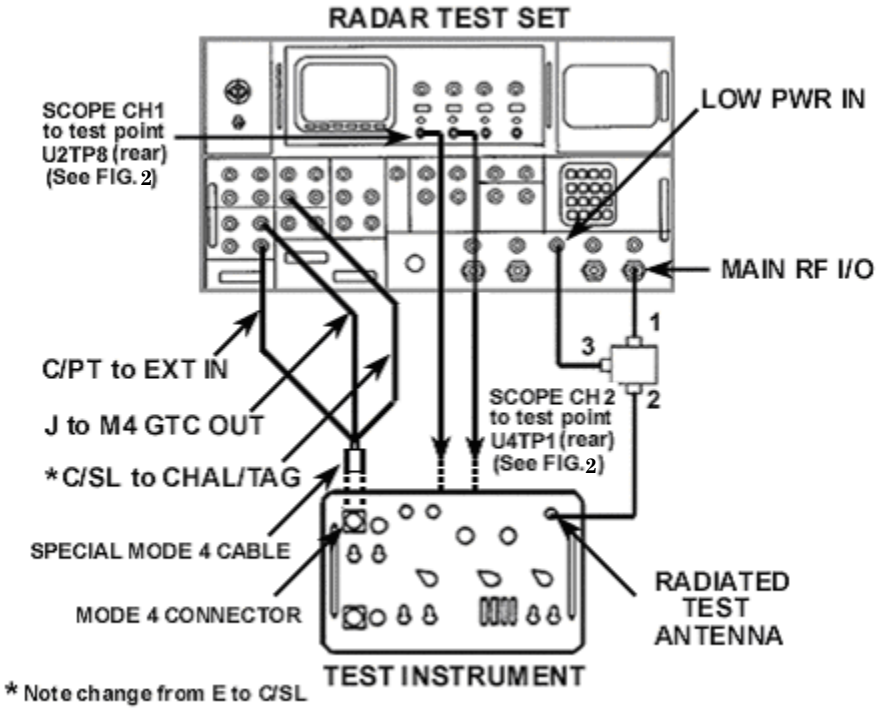



Figure 8. MODE 4 SLS pulse setup.

(2) Initialize radar test set by selecting **FUNCTION** and **ENTER**. Set radar test set **INTERROGATOR** menus as listed below:

(a) **Menu 2** - **M4: WORD C**, **S1** through **S4** to **ON**, and **S5** to **OFF**.

(b) **Menu 3** - **REPLY SIGNAL** to **MODE 4-3, M1** through **MC OFF**, **RANGE DELAY 1 μs**, **CHAL SOURCE** to **INTERNAL**, **F2 OFF**.

(c) **Menu 4** - **REPLY SIGNAL** to **MODE 4-3**.

(d) **Menu 16** - **SOURCE** to **LOW PWR** and **RF** to - **0 dB**.

(3) Observe **ACCEPT** indication on the TI.

(4) Set oscilloscope to view pulses on **CH1** and **CH2** inputs. Reduce oscilloscope **TIME/DIV** controls and adjust to display single pulses on **CH1** and **CH2** inputs.

(5) Measure pulse width of pulse on **CH1**. Pulse width will be between 0.3 and 0.6 μs.

(6) Position base lines of **CH1** and **CH2** on top of each other. **CH1** pulse will fit inside **CH2** pulse when both channels are coincident.

**b. Adjustments.** No adjustments can be made.

**18. Power Supply**

**a. Performance Check**

**NOTE**

Do not perform power supply check if all other parameters are within tolerance.

(1) Connect multimeter - (negative) lead to TI TP1 (fig. 2) and + (positive) lead to chassis. Multimeter indication will be between -50 and +50 mV.

(2) Move multimeter + (positive) lead to TI TP3 (fig. 2). Multimeter indication will be between 4.75 and 5.25 Vdc.

(3) Move multimeter + (positive) lead to TI TP2 (fig. 2). Multimeter indication will be between 11.5 and 12.5 Vdc.

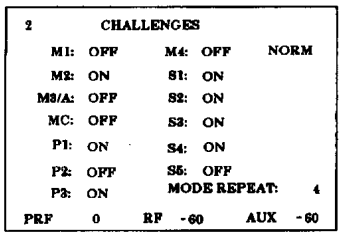
**b. Adjustments.** No adjustments can be made.

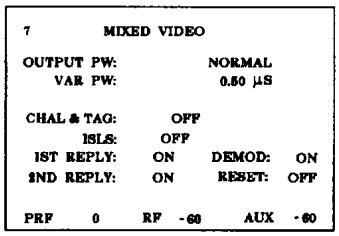
**19. Final Procedure**

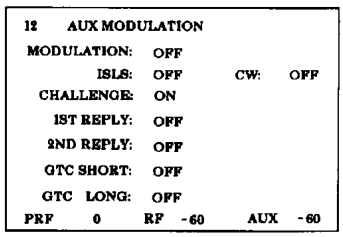
**a.** Deenergize and disconnect all equipment and reinstall protective covers on TI.

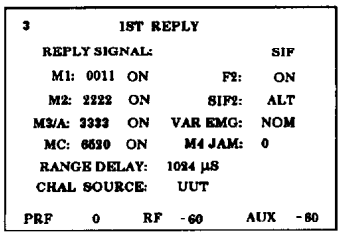
**b.** Annotate and affix DA label/form in accordance with TB 750-25.

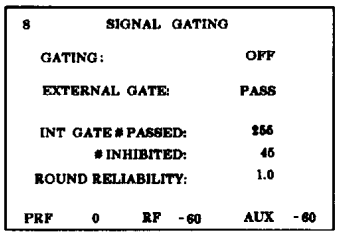
# APPENDIX A
# RADAR TEST SET MENUS

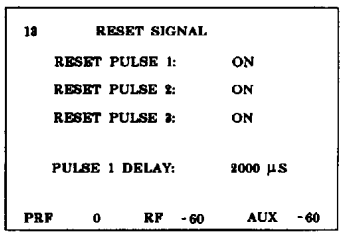


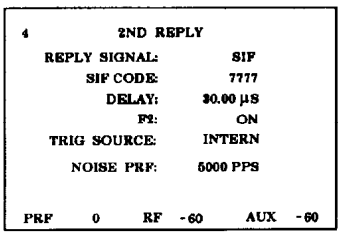



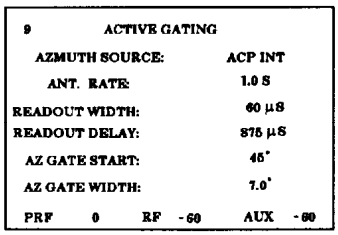



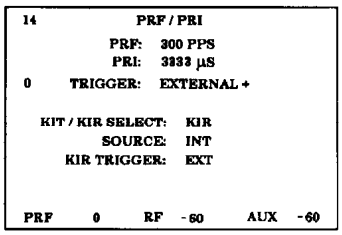



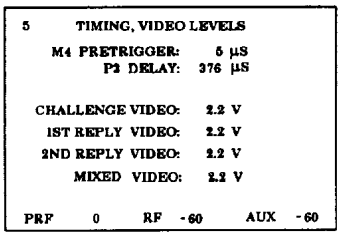



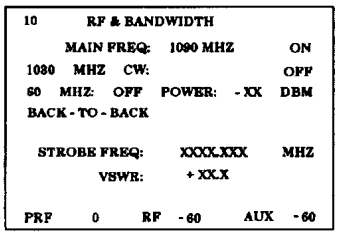



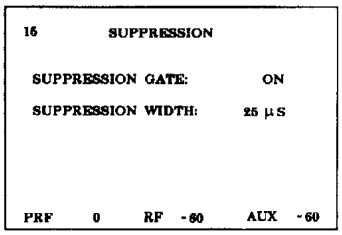



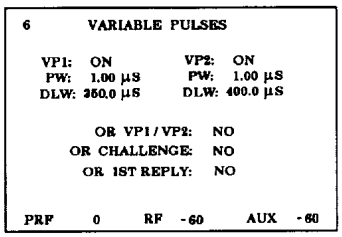



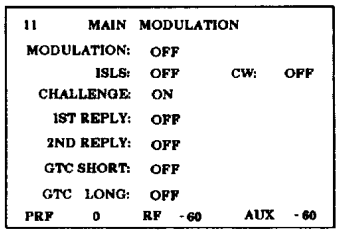



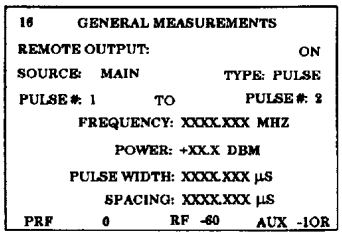



By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
*General, United States Army*
*Chief of Staff*

Official:

JOYCE E. MORROW
*Administrative Assistant to the*
*Secretary of the Army*

0808804

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 342045, requirements for calibration procedure TB 9-4920-358-24.

## INSTRUCTIONS FOR SUBMITTING AN ELECTRONIC 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however, only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" whomever@redstone.army.mil
To: <2028@redstone.army.mil

Subject: DA Form 2028

1. **From**: Joe Smith
2. Unit: home
3. **Address**: 4300 Park
4. **City**: Hometown
5. **St**: MO
6. **Zip**: 77777
7. **Date Sent**: 19-OCT –93
8. **Pub no:** 55-2840-229-23
9. **Pub Title**: TM
10. **Publication Date**: 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. **Submitter FName**: Joe
14. Submitter MName: T
15. **Submitter LName**: Smith
16. **Submitter Phone**: 123-123-1234
17. **Problem**: 1
18. Page: 2
19. Paragraph: 3
20. Line: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. **Text**

This is the text for the problem below line 27.