AN/UPM-155 Radar Test Set

NSN: 6625-01-307-0512

The AN/UPM-155 is accurate, reliable, and easy-to-use. It will contribute to your organization's bottom line by providing rapid, cost-efficient turn-around of IFF equipment while minimizing operator training requirements and skill levels.

GENERAL DESCRIPTION

The AN/UPM-155 Radar Test Set is being fielded as the U.S. DoD tri-service standard for IFF test equipment for the 1990's and beyond. As the AN/UPM-155 entered initial production in 1992, a new world standard in IFF test equipment has emerged. A general purpose test set, capable of testing all MK X and MK XII compatible IFF equipment, including transponders, interrogators and other associated system components, the AN/UPM-155 is designed and manufactured to meet full military specifications.

The AN/UPM-155 is microprocessor controlled, and features an interactive, menu driven user interface with onscreen help, a high resolution plasma display and an oscilloscope. An easy-to-use keyboard allows the operator to interface directly with the AN/UPM-155, which is completely self testing upon power up.

The AN/UPM-155 is readily expandable to accommodate emerging technologies such as Mode S and secure waveforms. Its open architecture allows for efficient hardware and software expandability.

Menu-driven automatic testing is available through the use of UUT-specific analog controller multiplexers (i.e., smart interface cables), which adapt the AN/UPM-155 to many common IFF components.

FEATURES

- Built-In-Test which provides both fault detection and fault isolation to LRU level
- Fully automatic transponder and interrogator test modes
- Analog Controller Multiplexers are developed which enable complete autotest of the following IFF equipment:
  APX-64 APX-76 APX-101 UPX-27 KY-533
  APX-72 APX-100 UPX-23 KY-532
- Additional analog controller multiplexers can be developed to address particular IFF autotesting requirements
- Local operator control or remote control through either a standard IEEE-488 or EIA RS-232C Interface
- High resolution display permits extensive operator instruction via menus and prompts
- Advanced measurement capability provides precise digital readout of RF power, frequency, pulse spacing, pulse widths and VSWR
- Mode 4 testing can be accomplished using KIT/KIR equipment (secure area required) or by using the UPM-155's integral simulator, which generates Mode 4 maintenance codes
- Operator-controlled, multi-function signal generator eliminates need for external pulse generators
- Modular construction with common CPU bus interface to each functional analog/digital and applicable RF module
- Designed for future growth with 20% of volume reserved for hardware growth and 100% CPU memory reserve. Additional memory possible through IEEE-488 or RS-232C Interface

NavCom
DEFENSE ELECTRONICS Inc.
4323 Arden Drive
El Monte, California 91731-1997
Telephone (626) 579-8689
Fax: (626) 444-7619

AN/UPM-155 Radar Test Set

SPECIFICATIONS

- **Operating Modes**
  Automatic interrogator test mode
  Automatic transponder test mode
  Manual interrogator test mode
  Manual transponder test mode
  Manual measurement mode

- **Interrogator Simulation Characteristics (Transponder Testing)**
  Modes 1, 2, 3/A, and C and Mode 4 sync, Word A, Word B and Word C challenges interlace capability with:
  ISLS control pulse (P2) Provision.
  Variable pulses 1 and 2 with 3 to 500 microseconds delay, 0.275 to 10 microseconds pulse width.
  Pulse repetition interval adjustable in 1.0 microsecond steps from 100 microseconds (10,000 prf) to 200,000 microseconds (5 prf).
  Mode repeat selectable from 1 thru 8
  Trigger source either internal or external
  Challenge delay from 0 trigger
  SIF-0 trigger to P3 pulse: 25 to 430 microseconds, 1 microsecond steps
  Mode 4-0 trigger to M4 pretrigger: 4 to 38 microseconds, 1 microsecond steps
  Mode 4 KIT Simulator
  RF challenge signal characteristics
  Carrier frequency -1030 MHz ±0.01 %
  Modulation

Challenges	Swept CW
CW	External

  Two amplitude independent signal generators each with an output level of -95 dBm to 0 dBm in 1 dB steps with ±1.0 dB accuracy
  Pulse ON-OFF Ratio >80 dB

- **Transponder Simulation Characteristics (Interrogator Testing)**
  Internal challenge decoder

  Two reply code generators

  1st Reply - independent replies for modes 1, 2, 3A and C
  0000 thru 7777
  Code Selection

OFF	Mode 4-3
SIF codes	Mode 4-1 pulse
SIF + X codes	SIF 1 train and SIF 2 train
Variable emergency	Mode inhibit select
Identification of position	

  Range delay selection from 0 microsecond to 4096 microseconds in 1 microsecond steps

  Pulse repetition interval selection from 100 microseconds (10,000 prf) to 200,000 microseconds (5 prf) in 1 microsecond increments

  2nd Reply - Codes 0000-7777, M4 3 pulse or 1 pulse

  Trigger Sources - internal, external, or from a noise source with a selectable average prf from 0 to 20,000

  Radar System Simulator
  Azimuth gate
  SIF target gate
  Readout gates
  North pulse and azimuth change pulses
  Synchronized by an internal north pulse, external north pulse or synchro input

  Mode 4 KIR simulator

  Selectable Mode 4 jamming patterns

  RF reply signal characteristics
  Carrier Frequency - 1090 MHz ±0.01%
  Modulation

Replies	Swept CW
CW	External

  Output level -95 dBm to 0 dBm in 1 dB steps with ±1 dB accuracy

  Pulse ON-OFF ratio >80 dB

- **Calibration**
  Calibration in less than one hour
  1 year Calibration interval

- **Measurements Characteristics**
  Input Power

Range	+10 dBm to +70 dBm (10KW)
Accuracy	±0.5 dB
Pulse Widths	350 ns to CW
Frequency	12 MHz to 1200 MHz
PRF	5 to 10,000

  Input Frequency

Range	12 MHz to 1200 MHz
Signal Level	+10 dBm to +70 dBm
Pulse Width	350 ns to CW
Accuracy	±0.02%
PRF	5 to 10,000

  Pulse Widths and Pulse Spacings (Std. AIMS)

Accuracy	±0.025 microseconds

  PRF

Range	0 to 1,000,000 PPS
Accuracy	±1 PPS

  VSWR

Frequency Range	1010 MHz to 1110 MHz
Power Range	+50 dBm to +70 dBm
Accuracy	±10% for 1.8:1 to 2.5:1 VSWR ±5% for 1.2:1 to 1.8:1 VSWR

  Bandwidth

Swept CW Range	±20 MHz from 1090 MHz
Strobe Provided	or 1030 MHz or 60 MHz

- **External Computer Interface**
  IEEE-488
  EIA-RS-232C

- **Environmental**
  MIL-T-28800 Class 3
  High impact shock MIL-S-901 Grade A, Type A
  Operating Temperature -20°C to 55°C
  Non-operating Temperature -50°C to +85°C

- **EMI**
  MIL-STD-461C

- **Reliability**
  3,200 Hr. MTBF

- **Physical Characteristics**

Size	25 x 19 x 16"
Weight	110 lbs. (less front cover and accessories) 135 lbs. (with front cover and accessories)

- **Demonstrated Maintainability**
  MTTR
  Radar Test Set: 14 min. 47 sec.
  ACM's: 24 min. 56 sec.
  Oscilloscope: 3 min. 35 sec.